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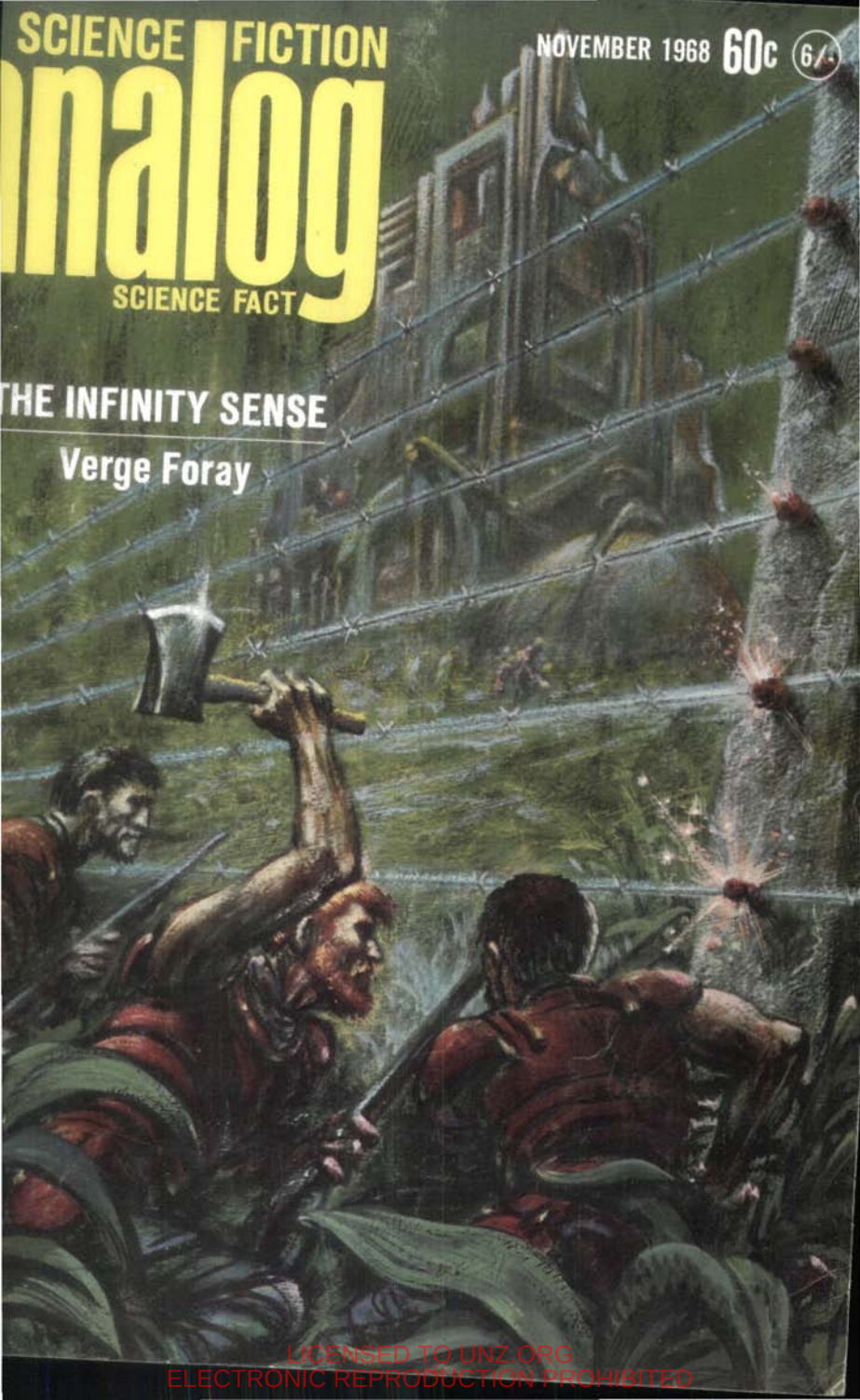
THE INFINITY SENSE

Verge Foray



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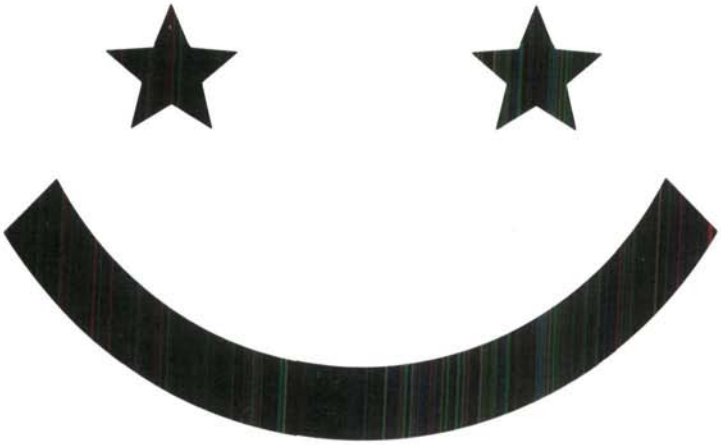

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NEXT ISSUE ON SALE
November 7, 1968
$6.00 per year
in the U.S.A.
60 cents per copy

Cover by
Kelly Freas

Vol. LXXXII, No. 3 November 1968

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Analog Science Fiction/Science Fact is published monthly by the Condé Nast Publications, Inc. Executive, Publishing, Editorial and Advertising offices: 420 Lexington Avenue, New York, N.Y. 10017. I.S.W. Patcévitch, President; Alfred W. Cook, Treasurer; Mary E. Campbell, Secretary. Second class postage paid at New York, N. Y. and at additional mailing offices, under the Act of March 3, 1879. Subscriptions: in U.S. possessions and Canada, $6 for one year, $10 for two years, $13 for three years. Elsewhere, $8 for one year, $16 for two years. Payable in advance. Single copies: In U.S., possessions and Canada, 60¢. Six weeks are required for change of address. In ordering a change, write to Analog Science Fiction/Science Fact, Boulder Colorado 80302. Give both new and old address as printed on last label. The editorial contents have not been published before, are protected by copyright and cannot be reprinted without the publisher's permission. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.

POSTMASTER: SEND FORM 3579 to ANALOG SCIENCE FICTION/SCIENCE FACT, BOULDER, COLORADO 80302.

EDITORIAL AND
ADVERTISING OFFICES:
420 LEXINGTON AVENUE
NEW YORK, N. Y. 10017

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political entropy

AN EDITORIAL BY JOHN W. CAMPBELL

The concept of entropy is not readily defined for most nonscientists; most people think they know which way time goes without having to have fancy tests for it. But for the physicist, the only now-known test for which way Time flows is "Entropy increases with Time." And Entropy is the tendency of randomness—disorder—to increase, and differences to level out to uniformity. A universe of gas at 10,000° would contain immense energy—but no available energy, so nothing could be done, because there is no difference. Because, therefore, entropy was complete—has reached the limit.

A universe of gas with half the gas at 100° and the other half at 1,000° would contain far less energy, but would be dynamic, active, busy *doing* and accomplishing, because the difference permits of *available* energy.

It seems to me that the United States is suffering from political entropy—for entropy applies to human affairs just as much as it does to physics. Americans have long been convinced that a two-party system is superior to a one-party system; a two-party system has less entropy—more difference—than a uniform one-party system. It has greater available energy, and can, and does, get more done.

Another way of expressing the same thing involves the realization that there are at least two sides to *every* human question, and *both* must be introduced and debated, weighed and appreciated, before decisions are made.

Originally, the two-party system did achieve that effect, and the nation prospered and grew.

Now it's an old saying that a politician can afford to come out against only two things—sin and the man-eating shark. While every politician must resoundingly main-

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tain the holiness of Motherhood and Freedom.

As I say, *every* question has at least two sides. Sin, be it remembered, is a matter of cultural definition in a very large measure—which leaves a lot of room for important, careful, and thoughtful debate. While we consider murder automatically sinful—remember that many highly ethical cultures have not defined killing-during-a-duel as murder, and war is not rated as automatically murder-sin.

As to the man-eating shark, in all human history not one instance of a shark attacking any human being in the human's home has ever been recorded; they have never been guilty of invading the land. While their God-given territory, which has been their native home for many hundreds of millions of years, has been repeatedly invaded by man, and it's only when man invades the sea that sharks attack.

Moreover, if some stupid little egocentric nymphomaniac forgets to take her pills and becomes pregnant—she may become a mother, but she remains just as much a stupid, selfish little nympho as she was before. What can a stupid mistake do to enhalo a selfish female?

I am, admittedly, taking very extreme cases of seemingly one-sided propositions—because it is important to recognize that *no* proposition is *entirely* one-sided.

Political entropy represents the development of an unitary political philosophy—a system in which there is only one *party* (Communist or Nazi, it makes no difference) or only one *philosophy* permitted.

The United States is rapidly approaching not a one-party system, but a one-philosophy system, that one philosophy being completely common to both parties.

The result is that the voter is offered a choice of party candidates —but no choice of philosophy. The situation is essentially similar to that of a man told, "You will be permitted a free choice; you can decide whether you would rather be shot, or hanged." Certainly he is being offered a genuine choice between two different things; it's objectionable only in that both choices have the same result.

For a good many years now, the two parties in the United States have been offering a similar choice situation—you, the voter, are offered a free choice at the polls, as to whether you want a Democrat or a Republican. But the two parties are both offering exactly the same basic philosophies, with no basic difference.

The great issues facing the country are crime, Negro riots, international trade balances, and the Vietnam War. *Every* issue has two sides —but both parties are on the same side of every one of those great issues. We are not offered any true choice; only a variation of slight differences of method. "Do you

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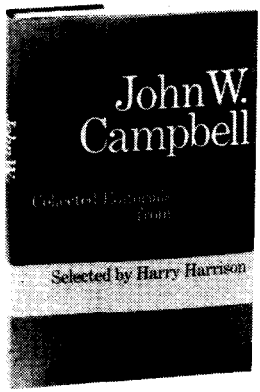

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want your egg fried or scrambled?" What if I'm allergic to eggs, and want hot cereal?

For example, both parties loudly proclaim themselves friends of labor, and the development of strong Unions.

There are two sides to that question, too. Unions, today, are monopolies in restraint of free trade; they are organizations specifically intended to apply force to compel people to obey their dictates. Labor unions have been granted the legal right to use force to block the operation of companies and public services—the only group in the society who were granted this right of force for many years.

There is going to be one bee-*you*-tiful smashup one of these days, because currently the everybody-on-one-side-of-the-issue politicians have now granted another group the right to use force to compel compliance with their wishes—the Negro protest groups now, also, have that privilege.

Sooner or later the Unions will come into head-on collision with the Negro groups, and the resultant fireworks will be . . . well, "interesting" let's say.

If the Unions have the right to block anybody from normal activities, and the Negro groups have the right to interfere with anybody's activities—what happens when they disagree?

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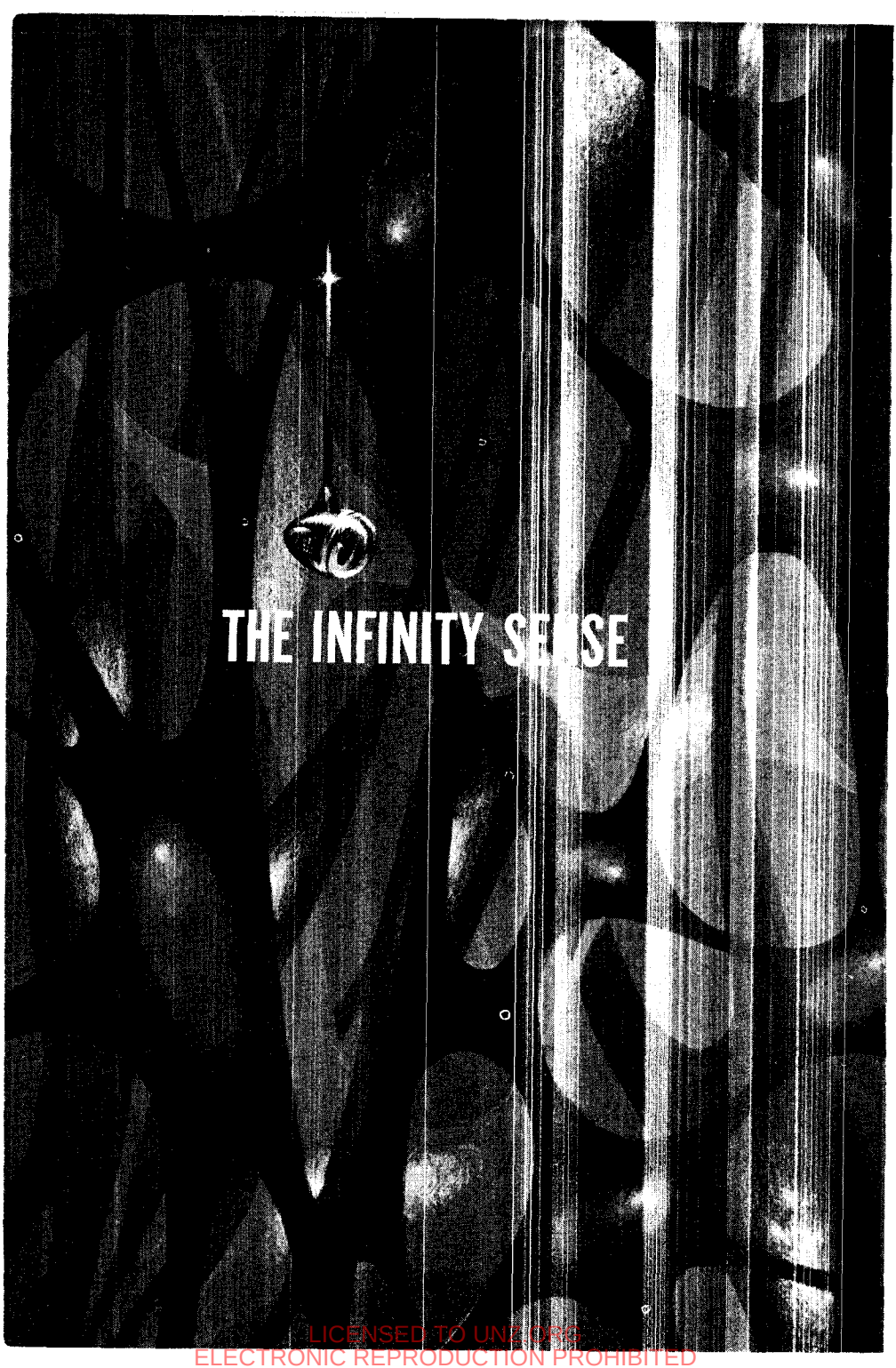

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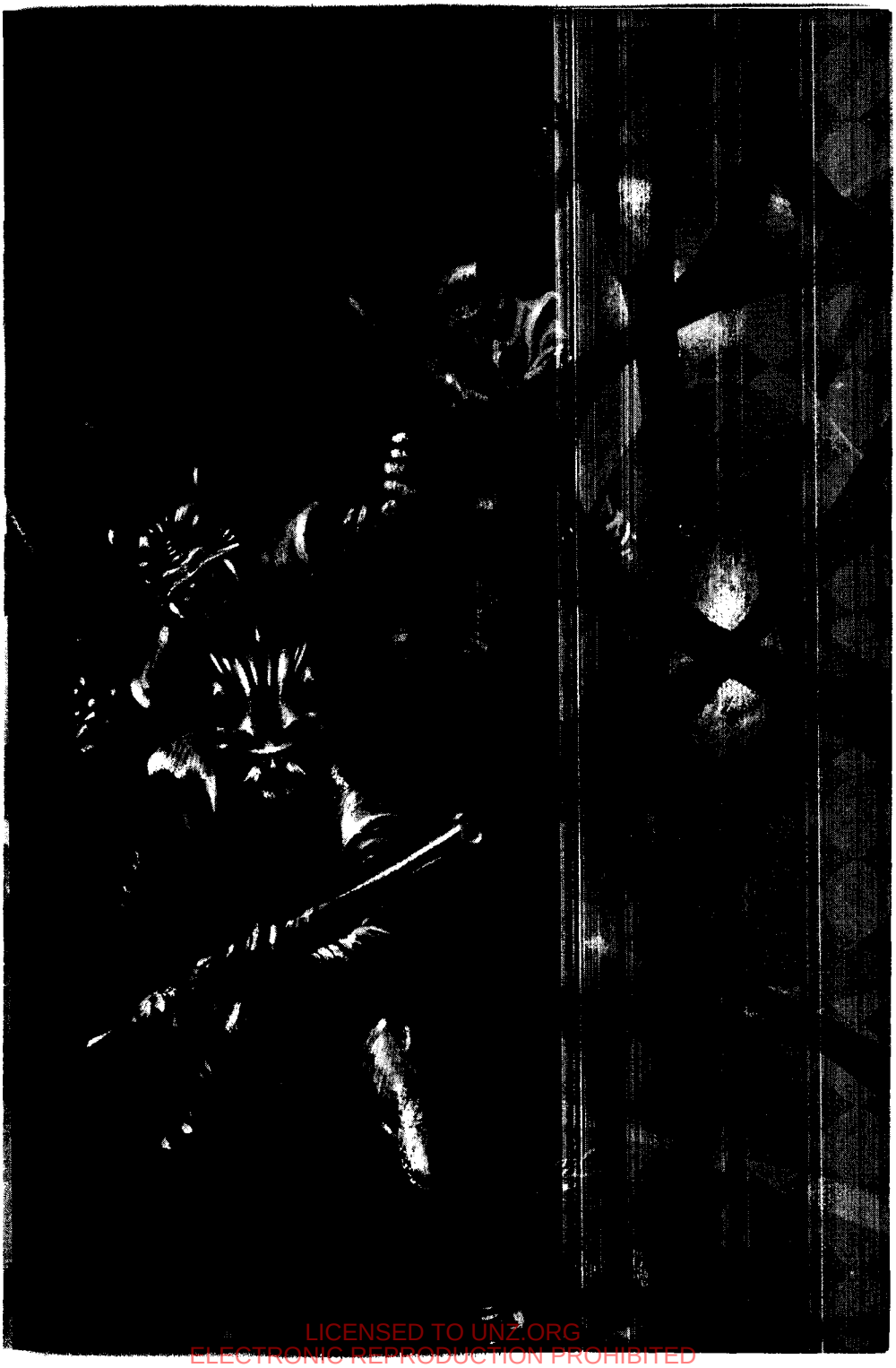

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"Tragedy," I think, is best defined as a conflict between Good and Good; the conflict of Good vs. Evil is mere melodrama. And, strangely, getting Good to cooperate with Good is far more difficult than to get Evil to cooperate!

VERGE FORAY

Illustrated by Kelly Freas

The world opened for Starn of Pack Foser one day when he was eight years old.

He had gone nearly a mile down the creek from the Compound, into a swampy tangle far from the farmed land and grazes, in hope of getting away from the other boys. Maybe Huill or Rob wouldn't bother to follow him so far, or, if they did, maybe he could guard his thoughts so they couldn't find him.

The young telepaths seldom left him in peace. The fact that Starn was large for his age, and much taller and stronger than any other eight or nine-year-old in the Pack, seemed to give them all the more delight in their little tortures.

Starn was not a telepath, or much of anything else. His father Virnce was a pretty fair perceptor, and his mother Becca premonated now and then, but Starn couldn't do hardly anything. His only trace of a Novo ability was a sense of danger that was too weak to amount to much.

So he had to control his thoughts in the swamp if he wanted to avoid discovery. He had to think things that most anybody would think, and avoid thoughts that could be identified as coming especially from him. Adults were good at doing that, after years of experience, but it was exceedingly hard for Starn.

So as he sat by the creek fishing he busied his mind by reading the book "Sacred Genetic Law" which his father had given him the year before. Lots of people read religious books if they had time to spare in the afternoons, so if he kept his mind on the book he figured he would be fairly safe. He would rather have thought about other things while he fished—of growing up to be a great raider, and leading unbelievably successful attacks on enemy Packs, and pillages of Olsapern trading posts, or even taking a whole army through the Hard

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Line and slaughtering hundreds of Olsapern infidels in their own country. But Huill or Rob would know if he thought things like that. So he read.

Book-English, the language in which all writing was done, was a funny language. It left out a lot of r's, especially before n's where they most always came in common talk. And it put in a lot of d's, and used m's to begin many words that really started with an n sound. It seemed to Starn that it would be better to write Book-English the way people really talked, but the Pack teacher had explained that if that were done, the religious texts would have to be revised into the new writing or people would forget how to read them. And nobody would *ever* revise the religious writings.

It was hard to believe the Olsaperns actually talked the way Book-English was written, but they did. All the kids laughed the time the teacher spoke some Olsapern to show them how it sounded. She had called Starn "Stan"—and that was something else Huill and Rob wouldn't let lie. They were always yelling "Stan, Stan, the Olsapan!" at him, and making like he really was an Olsapern because of his size and lack of Novo senses.

Perhaps this identifying thought was what gave him away, but when he sensed trouble it was too late to escape. Huill, Rob, and another boy named Houg were almost upon him. They had sneaked through the bushes, and when he detected their presence and turned they were running at him full speed. It didn't take telepathy to know they meant to push him into the creek.

Frantically Starn thought of using his fishing pole to punch them away, but that wouldn't work because they could read him and dodge the way they always did. Or he could grab a rock and . . . but that wouldn't work either.

At the last split-second, without thinking about it, Starn flopped sideways to hug the ground. Huill stumbled over him and fell down the bank. He hit the cold water with a yell. Rob was also thrown off balance and skidded down the bank on his belly, managing to stop at the water's edge. He was liberally smeared with mud.

Houg, who wasn't a telepath but a perceptor, was not caught so badly off guard. But when Starn sat up and glared at him, Houg backed off. Without the help of his telepathic buddies, he was no match for Starn and he knew it.

"T-that was a dirty trick!" shivered Huill, climbing out of the creek with his buckskins dripping, and close to tears. "You done that and didn't *think* it!"

Starn was as startled as they were. He wasn't sure just how it had happened, or if he could do it again, or . . .

"Push him in, Houg!" yelled Rob. "I'll tell you what he's thinking!"

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Houg grinned and started toward Starn, who thought of flopping on his other side and jerking Houg past him, or getting up and fighting it out despite the coaching Houg would get. But Rob was spouting his plans faster than he could make them so . . .

Without planning, Starn swished his pole back over his shoulder, as if landing a fish, and dealt Houg a lashing blow on the top of his head. Houg bellowed and hastily scampered away, feeling his stinging scalp for blood.

Despite his size, Starn had never won a fight before. He felt confident and elated. "Come on! Just try something!" he challenged fiercely.

"You wait till my mamma finds out!" whined Rob, trying to rub the mud from his clothing. "Look what a mess you made!"

"Your ma'll just whip you for being a *clumsy oaf!*" retorted Starn, delighting in using the epithet that had so often been used on him.

"I'm going home!" quavered Huill.

"Me, too," said Houg.

"O.K.," giggled Starn. "Huill, you're wet anyhow, so you carry my fish! And Rob . . . well, a little mud won't hurt my fishpole. And Houg, carry my Book-English book!"

"I ain't carrying your junk!" Rob yelled.

Starn's fist flew up suddenly and hit him in the nose. "You take that pole!" he ordered.

Rob sniffled, and obeyed, as did Huill and Houg.

But Starn gave in to their pleas before they got back to the Compound, and did not force them to humble themselves by carrying his stuff in front of the adults of the Pack. But in an isolated community of less than two hundred souls, with one out of every half-dozen a telepath, the full story wasn't long in getting around. The fact that Starn had outmaneuvered two telepaths was widely discussed around many hearths that night. Such a deed was unheard of, and there was ample speculation on the nature of the sense Starn had suddenly learned to use.

Starn basked in this new experience of adult approval, and resolved to heed the advice of his father to give his new sense a lot of exercise and make it strong.

The Foser himself visited Virnce's hut that evening, and he spoke to Starn for the first time the boy could remember.

To his parents the Pack chief said, "You must be mighty proud of your lad."

"Indeed we are!" beamed Becca, and Virnce nodded. Starn decided The Foser was awful good to say something like that about him, especially in front of the neighbors who had dropped in to talk.

Turning to the boy's father the Pack chief said, "Virnce, I'm told you have some interesting thoughts

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on the significance of all this. I'd like to hear them."

Virnce looked uncomfortable. "A man's thinking about his own children suffers from immodesty, Foser," he protested.

The Foser shook his head. "You were never a man to hold false pride, Virnce. And you understand and abide by the teaching of the Sacred Gene as well as any man in the Pack."

"Well," Virnce began slowly, "we are sometimes troubled at heart by false beliefs of the Olsapern kind, that we of the Packs are not the chosen of the Sacred Gene. The infidels claim that when Science fell long centuries ago, the whole of humanity suffered a deep spiritual shock of such potency that the very chromosomes of our forebears cowered in despair, and beat an evolutionary retreat.

"Thus, they pretend, we of the Packs are not a people far advanced toward the Ultimate Novo, but rather are throwbacks toward the ancestral man of a million years ago. They would have us believe that, far from leading us onward, the Sacred Gene has not simply forsaken us but has pushed us backward into savagery! They choose to ignore, or to explain away, our durable if humble civilization, the continued literacy of our children, and above all our blessed Novo senses.

"But there is, in the Novo sense my son has revealed today, something the Olsaperns cannot explain away! We know the early prophets, even in the days before Science fell, were aware of traces of telepathy, premonition, perception and the various other Novo senses in certain people of their own time. We need not believe the evil theories of the Olsaperns, that these senses were present even in the most primitive men, were perhaps even prevalent at the dawn of humankind. We need not believe this, but we have been hard put to disprove it!

"However," and here Virnce's eyes glinted triumphantly, "even the oldest of prophets and commentators make no mention of such a sense as Starn's! Nothing like it has ever been known before! It is new —Novo without question! And it is a clear manifestation of the logic and balance with which the Sacred Gene leads us forward to the Ultimate, in that it provides a desirable foil and counter to the telepathic sense he has previously bestowed on us!

"I cannot help but believe, Foser," Virnce concluded solemnly, "that in my young son the Sacred Gene not only sends us another bountiful blessing, but that he is giving his people a convincing reaffirmation: The Gene is with us; he is with us indeed!"

At that inappropriate instant Huill's mother Nari rushed into the hut and hugged Starn's mother. "Oh, Becca!" she gushed, "I'm so happy for you and Virnce! We've

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all felt such sympathy for you, and for poor little Starn! And now it turns out that he has this marvelous instinct!"

"Instinct?" flared Becca, pushing Nari away in anger. "What kind of Olaspern talk is that? As if Starn were an *animal!* Honestly, Nari, you are the most exasperating woman in the whole Pack!"

"Oh, I'm so sorry, Becca!" Nari apologized. "The word just slipped out!"

"I'll bet it did!" huffed Becca.

"Easy, Becca," soothed Virnce, putting a hand on his wife's shoulder. He looked at The Foser, at Starn, at the others gathered before his fire, and said, "Perhaps the whole Pack has been engaging in Olsapern talk tonight, like a group of proud, senseless scientists trying to explain a new star, or a new kind of fruit. I perhaps more than the rest of you have been guilty. In our first excitement over Starn, we can pray this was a forgivable error."

In a voice of impressive depth he finished, "But we must not persist in this! Hereafter my wife and I will seek to see Starn as what he is—a blessing from the Sacred Gene to be accepted humbly and gratefully, with no questions, no attempts to pit our meager wisdom against that of the Sacred Gene himself!"

"Amen!" exclaimed Becca, with a final glare at Nari. And the others, The Foser included, echoed the word.

Good things kept happening to Starn after that. A few months later, for instance, the Pack chose his father as the Gene's Voice for the Tenthday services.

But the boy was too fascinated with his new-found sense to give more than the required amount of devotion to its mighty Bestower. He spent an hour or two every day working with Huill or Rob in mock contests, learning to act effectively, and without thinking, to meet the challenges produced by his telepathic friends. There wasn't really much to learn, except to do it. That was the right way, anyhow, because as his father had said, it would be wrong to try to figure out how the sense worked. That was the Sacred Gene's business, not his.

Starn made the most of the world which had opened to him that day by the creek. Because his sense was superbly useful in battle, especially in the raids and counter-raids on traditional enemy Packs that had telepaths to be outwitted, his childhood dream of being a great warrior promised to come true. In fact, at the age of nineteen he was elected Raid Leader of the Pack. Even at that age he was the tallest of The Foser's men, and had physical strength to match his impressively rugged appearance.

Another high moment came when he was twenty-two. That was when he found his wife, Cytherni, at the annual spring parley of Packs allied to the Fosers.

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Cytherni was a lovely girl, and as he had suspected from their first meeting she was not basically the timid person she appeared. Her initial shyness with him, and later with the entire Pack when he brought her home, was real, but he could guess its cause easily enough.

In fact, part of her attraction for him was a sense of similarity—a feeling that "there but for the grace of the Sacred Gene go I." Like himself, Cytherni had displayed little Novo capability as a child; but unlike him, she had never revealed such talents later on. Starn could readily imagine himself growing up, without his "surprise sense," into a person much like Cytherni. It gave him deep pleasure to see her bloom, with fears and self-doubts forgotten, when they were alone together.

But just four months after their marriage, Starn's bright, open world began closing.

II

The trader Nagister Nornt was known by repute to every Pack east of the mountains. Many people said he was the closest man to the Ultimate Novo—the goal man of the future—then alive. Without question, his powerful Novo abilities made him someone to be feared and hated. He was a dangerous man.

But he was also a trader of unusual scope, trafficking in many goods the Packs needed—salt from the coast, bulletlead perhaps from the ruins of some ancient city, and fine, but honest, cloth from Packs far to the south who had maintained the arts of weaving. Thus, when word came that Nagister Nornt was heading their way, the people of Pack Foser were both pleased and disturbed.

The point was carefully drilled into the children that Nornt was a man to be hated, because that was the best defense against a telehypnotist who could invade and enslave an unwary mind. And they were warned not to take even the briefest nap during the several hours Nornt would be in or near the Compound, because they couldn't hate him while they slept, and could wake up with their wills in his control, doomed to be Nornt's slavies for the rest of their lives.

The trader arrived one midmorning with his vacant-eyed slavies and his heavy-loaded train of mule-drawn wagons. The Foser greeted him ceremoniously, at the same time making it clear that Nornt was to conclude his business there by midafternoon and be at least three miles away by nightfall. Nornt agreed, showing his protruding yellow teeth in an ugly grin, and proceeded to display his wares in the Compound yard.

He was a hunched, heavy man, better described as hairy-faced rather than bearded. He looked as if he had grown bald-jowled and had left untrimmed the few straggling facial hairs that remained. He smelled un-

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clean. Nornt was, indeed, an easy man to abhor. Starn wondered, as he made his rounds to assure himself that the Pack's men were all armed and alert for trouble, why the trader didn't fix himself up a bit. Surely, if hating Nornt was a good defense against him, the trader shouldn't make the hating so easy for everybody. But then the Sacred Gene had made Nornt's personality what it was, and perhaps the man was unable to change his ways.

Nornt glanced at him and chuckled, evidently amused at Starn's thoughts. Starn regarded him coldly before moving away.

But Nornt had beautiful cloth, and Starn had a young and lovely wife. It was necessary for them to do business.

When Starn returned with Cytherni, the trader was a few yards from the cloth display with his back turned, haggling with one of the older wives over a skin of salt. Cytherni fingered a swath of light-blue fabric under the dull but watchful eyes of a slavie.

"How much prime leather for the blue?" Starn asked.

"Trader trades," the slavie said tonelessly.

Starn shrugged and reconciled himself to dealing directly with Nagister Nornt.

Nornt soon concluded the deal for the salt and turned to face Starn and Cytherni. He did not move toward them but stood motionless, his eyes examining the young woman with uncouth interest.

Huill hurried to Starn's side. "Watch out!" he warned. "He's yenning for Cytherni!"

"I can see that!" growled Starn.

"But he means to have her!" the telepath hissed urgently.

Starn swept a rapid glance over the slavies and found them reaching for their knives, pistols, or longguns. *"Hold it, Nornt!"* he yelled. "Start anything here and you're a dead trader!"

"I think not!" cackled the trader. "Your men don't have—"

In a flash Starn whipped his throwing knife from its sheath. It zinged through the air to plunge deep into Nornt's right shoulder. The trader screamed and fell, and his slavies lost interest in their weapons.

"He read us that you could do things like that," Huill explained excitedly, "but he didn't believe you could fool him!"

The Foser came hurrying up. *"Trading's over!"* he bellowed. "All you women and kids go home! Get inside! Nagister Nornt, pack up and get out!" All moved to obey except Cytherni, who seemed afraid to stray from Starn's side.

Grimacing horribly, Nornt got to his feet. One of his slavies pulled the knife from his shoulder and helped him to a comfortable seat, where another removed his filthy jacket and bandaged the wound. Meanwhile the other slavies began

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repacking the wares and hitching the mules.

Within fifteen minutes Nornt was helped onto a wagon seat and the train started out of the Compound. The trader turned to direct a final baleful stare at Starn as he departed.

"Holy somes!" cursed Huill. "He's raving mad! I never read such hate in my life! He's not through with you, Starn! He means to even things up, and get Cytherni!"

"Let him try!" said Starn grimly. "He'll just get more of the same!"

"I don't know, Starn," said the worried telepath. "You caught him at a disadvantage today."

"No I didn't! His slavies had their weapons drawn!"

"Yeah, but to his way of thinking, he was still at a disadvantage! He was *here*, where he could be attacked, and he didn't have to be! What if he'd been waiting half a mile away, and had sent his slavies to take Cytherni or anything else he wanted? He can do that, you know! And slavies are cheap to him!"

Starn frowned. "Let's not think more about it while he's in reading range," he said. "Are you all right, Cythie?"

His wife wore a sick expression, but she nodded.

"His looks revolted her," Huill said helpfully.

"I'd better get you home," Starn told her.

That night the Pack's chief men met by The Foser's fire. Nagister Nornt, the telepaths reported, was camping for the night five miles west, and intended to continue in that direction, trading with the mountain Packs, for several weeks before turning back. But he did mean to return to Foser Compound.

"We won't let him get close!" growled Starn.

"Don't underestimate him," warned The Foser. "Huill, what do you make of his attack strategy?"

"It isn't clear," said the telepath. "He can control his thoughts unusually well, and has avoided thinking about his plans. But the picture I got was of him waiting in some safe place, and sending his slavies up to read us—he can use them as telepathic relays, you know—and to snipe our scouts and sentries. If we go out to fight, the slavies kill some of us while we're killing them, and if we don't go out they besiege the Compound. We'd have to go out."

With an unhappy expression Huill continued, "But, if we do kill his slavies, he'll just recruit more from Packs that aren't alert for trouble, or from farms that can't keep telepathic guards out all night. Thirty slavies at a time is about all he can control without straining, but he can get new ones faster than we can kill the old ones, and after each battle there'll be fewer of us left for the next fight. He means to get what he wants if he has to wipe out Pack Foser to do it!"

Starn bolted to his feet. "This is between Nornt and myself!" he

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snapped. "It's my fault for not finishing him today, and I'm going after him right now!"

"Sit down," said The Foser sternly. "Sit down and listen to me!" It was an order, and Starn grudgingly obeyed.

"Nagister Nornt was taken by surprise today," the Pack chief said, "because he didn't believe in your sense. Now he's seen you in action, and he won't be off guard a second time, tonight or later. He's a wily man, Starn, who's survived many battles and knows how to protect his skin. His slavies would come at you singly and in bunches, and you would have to kill them all before you got a crack at him! Don't forget that every one of those men is under his complete command! Their bodies are his, as if his brain was in each of them! Don't let the dull look of their eyes fool you!

"As for this being your fight and not the Pack's," The Foser continued, "you know better than that! You know no Pack can let an enemy demand and get his choice of its women or children! A Pack that sells out the least of its people is soon no Pack at all, but the timid prey of any raider who comes along!

"Neither the Pack nor your wife can spare you, to get yourself killed in a foolish one-man venture against Nornt! You'll defend your wife as a leader of the Pack!"

Starn snorted. "Defend her *how?* You heard what Huill said! How do we beat Nornt against that kind of strategy, and with guns no better, if as good, as his slavies have?"

"That's why we need you," The Foser explained. "Your sense will provide the answer if anything will."

Starn grunted and stalked unhappily around the fire. "My sense will help *me*, but in a long series of scattered skirmishes I can lose a lot of good friends, and the Pack a lot of good men, while I'm engaged elsewhere! The only way we could win would be to push through to Nornt himself, no matter what kind of defenses he threw up! We'll waste many men doing that—unless we have weapons far better than anything in the slavies' hands!"

After a moment The Foser said, "Well?"

"Well," Starn replied angrily, "we'll have to get the weapons we need! We'll have to raid the Olsaperns first, so we can fight Nagister Nornt!"

III

A raid on an Olsapern trading post wouldn't have helped. The posts were not defended by any weapons worth stealing. Starn wondered about this sometimes. Why were the Olsaperns so unconcerned about their trading posts being pillaged? Of course about the only goods they stocked were basic rations, which were freely stolen during drought years and long winters to keep the Packs alive, and such items as books and artificial fab-

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rics, both of which the Packs disdained in favor of the honest cloth and books certain Packs produced for trading. The fact that the trading posts stayed well-stocked and practically defenseless was just one more example of the idiocy of the Olsaperns.

But the Olsaperns did have a few outposts in Pack country that were heavily defended, with the kind of weapons the Pack needed. The only such installation close to Pack Foser was a copper mine twenty miles northwest of the Compound. The mine would have to be raided.

This was not necessarily a desperate risk. The Olsaperns were a cowardly lot who seldom chose to expose themselves to battle. Trading-post keepers invariably deserted their stations when under attack, to scoot away like frightened birds in their flying machines, seldom stopping before they were safely behind the Hard Line hundreds of miles to the north.

But the mine's defenses were automated and could prove deadly effective. Starn was well aware. Perhaps the Olsaperns didn't much care about their trading posts, but they obviously cared about the tons of ore they removed from the mine each day, to carry off in giant flying wagons. Not since the days of Starn's great-grandparents had the mine's perimeter been tested by Pack raiders, and that attack had been a disaster. Ten raiders had been killed, and twenty-eight captured and subjected to the Treatment.

Of course the long decades of peace following that raid could have lulled the Olsaperns into letting the defenses fall into disrepair. That could be hoped. Nevertheless, Starn laid his plans with strict care to minimize potential losses and to put his men at the best possible advantage. With Huill's help he questioned the Pack's oldest members, to get the most direct accounts available of what the long-ago raid had encountered.

What he learned made him delay the attack for three weeks, fretting over the possibility that Nornt might return earlier than expected, but convinced that the raid would be far more likely to succeed if carried out in the right kind of weather. When at last the premonitors advised him a day-long rainstorm was due, he led his thirty-man party forth to the attack.

They approached the mine complex in a heavy downpour, and were thoroughly soaked beneath their hard-leather armor and face masks.

Starn intended no broad frontal attack. Against automatic defenses that would probably do nothing but increase the casualties among his men. What he hoped for was a point penetration, the driving of a hole through the perimeter defenses, by which all could enter and defeat any last-ditch stand of the Olsapern miners.

The task of making the penetra-

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tion he reserved for himself. His men gave him argument about this, but they had to admit that he was best equipped for the job. Though there were no telepathic defenders for his special sense to surprise, his ability to act instantaneously and effectively served him well in any tight spot where there was little time for thought.

The first barrier was a fence of steel mesh, intended mainly to keep animals and hunters from straying onto dangerous ground. The party quickly chopped a slit in the mesh, and Starn stalked forward through the forest which continued for several hundred feet inside the fence. With him were Huill and a perceptor, Jaco. Six more men followed twenty yards behind, spreading out only slightly to explore the sides of the route and under urgent orders to take no chances. Their essential duties were to mark the trail clearly and to back up the three-man point, protecting its rear and coming to the rescue if that proved necessary. At intervals behind them followed two four-man squads, and then a string of two-man teams.

This needle of men was wide open to flank attack, but with defenses automated Starn expected no such counter. The unmanned weapons along their flanks would almost certainly stay poised for a frontal assault, and the only defenses the raiders needed to worry about were those almost directly ahead of them.

Have we sprung a warning system yet? Starn wondered.

"No," hissed Huill. "The Olsaperns are still thinking about their work, not about us."

Starn looked a question at Jaco, who shrugged an answer. He was percepting nothing worth reporting.

They came to the edge of the forest. Beyond lay what was once a clearing but now had grown a fair amount of cover in the form of bushes and young evergreens—a promising sign of neglect. The buildings clustered at the mine shaft rose into view no more than two hundred yards away. The only visible barrier was another fence, this a high one of strung barbed wire, some distance inside the old clearing. The scene looked dreary and deserted under the thick clouds and hard-blowing rain.

"Slowly," warned Starn, and he moved forward with Huill and Jaco close behind. Suddenly his long-gun pushed back against his chest, stopping him in his tracks.

"We're at the Metal-Stopper," he hissed over his shoulder. "I'm going to try to push through." He got a firm purchase with his cleated boots and shoved forcefully against his long-gun. It broke clear of the unseen barrier and he fell forward a few inches, to be stopped by the knife and hatchet attached to his belt. Another hard lunge put these metal objects past the barrier also.

As he had theorized, the Metal-Stopper was electromagnetic, and

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whatever electrical fields supported it were partially shorted out by the heavy rain. Beyond this point the earlier raiders had gone armed only with stone and wooden weapons.

"Try to get through," he told his companions.

"They know we're out here now!" Huill reported as he, too, pushed his ironware past the barrier, with Jaco close behind.

"WARNING TO INTRUDERS!" a mechanical voice bellowed in Book-English. "YOU ARE TRESPASSING ON A HEAVILY-DEFENDED INSTALLATION OF . . . OMBINE! RETU . . . EDIATELY, OR WE WILL NOT . . . SEQUENCES! REPEATING! WARN . . . UDER . . . ARE TRESPASS . . . FENDED INSTALL . . ."

"That's scaring them more than it is us!" chuckled Huill. "They think if their loudspeakers are out of whack, their weapons might be, too!"

"What are the weapons like?"

"They don't know. They were all installed before their day, and are kept secret from them so telepaths can't read them. But they're wishing they had some really good stuff out here!"

Starn nodded. "Let's move on."

They walked forward slowly, Starn not bothering to stay under cover of the bushes, which he figured would be a waste of time and add dangerous footage to the length of their trail.

"Something's moving!" Jaco hissed.

"Down!" yelled Starn, hitting the dirt. A split-second later a fearsome *tat-tat-tat!* startled them, and twigs and leaves were shredded over their heads.

"That's a rapid-fire gun!" yelled Huill.

"Where is it?" Starn shouted back.

"Beyond the barbed wire!"

We could use something like that, thought Starn. He motioned to the others and began crawling forward on his belly. He had not gone far when the gun's chatter ceased.

"It's jammed," reported Jaco.

"Anything else moving up there?"

"No."

Cautiously Starn rose to his feet. Nothing happened, so he walked on toward the fence.

"Ferrik in the back-up didn't duck fast enough," said Huill. "Bad flesh wound in the shoulder. He's being tended."

Starn nodded and kept moving. The fence, he saw, was of horizontal heavy-gauge, single-strand barbed wire, the strands about a foot apart. This was as far as the long-ago raiders had gotten, because the wire was electrified and they had lacked the means of attacking it. They had spread out along it in search of a weak spot, and that had cost them dearly.

The electricity was on, as Starn could tell from steam rising from

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the wet insulators on the fence posts. The rain was helping them again by shorting the wires to some degree.

"Did Houg get that chain through?" he asked.

"Yes," reported Huill.

"Tell him to bring it up."

Houg came warily forward from the back-up group, lugging a length of heavy chain.

"Put it down here," said Starn, "and all of you move back a little." As they did so, he picked up the chain, swung it in his hand to get the feel of it, and then tossed it into the barbed wire. A noisy uproar of sparks erupted as the iron links looped over the lower four strands and shorted them into the soggy ground.

"Wow!" complained Houg.

Starn's expectation was that the sparks would burn through the wire strands, or at least weaken them enough for him to finish the job with a quick, fairly safe swipe of his hatchet. After watching the sparks briefly, he decided the hatchet would be necessary to part the heat-resistant wire.

He wiped the hatchet handle as dry as he could get it and moved up to kneel carefully beside the dancing chain, ignoring the sparks leaping about him. He leaned forward on his left arm, took precise aim at the wires and brought the hatchet down in a firm stroke.

There was an instant of elation as he felt the blade slice through the strands, but after that a sudden nightmare of pain and confusion.

The loose ends of the wire whipped and coiled like unleashed spring-steel snakes. One caught him murderously in the groin, shredding his protective leather and his flesh like so much wet paper, before jerking away to roll into a tight coil against the nearest post. Another grabbed his left forearm and didn't let go. It wrapped the arm in a tearing, bone-snapping grip, and dragged him hard into the post.

Dimly he heard Huill shouting something about "Memory Metal," and felt his companions tugging at him. I know about things like that, he thought in a strangely detached way. A rubber band that goes back to its original shape after it has been stretched a long time. But who would have thought a coil of wire could be made with such a strong memory, and one that would last for so many decades!

He pulled his mind back to the job and ordered, "Never mind me! Go get that gun! And other weapons!"

He didn't know if the order was obeyed or not.

IV

The bed fabrics felt sleekly soft to his hands, and the bed itself strangely smooth. When he opened his eyes the flat whiteness of the ceiling overhead told him he definitely was not in Foser Compound.

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An Olsapern hospital-prison? He had heard of such places from certain elderly Pack men who had been in them after being wounded and captured in skirmishes with the Olsaperns. They had been healed, given the Treatment, and released.

Suddenly remembering the slashing barbed wire, he lifted his left arm to examine it. It was strong and whole. But it wasn't *his* arm. A graft. He wondered who it had belonged to as he studied it, comparing its fingers—a little too long and thin—to those of his right hand.

But he had received another injury. He quickly reached under the cover to explore with anxious fingers. What he didn't find left him with a dismal empty feeling.

Despite his father's position as the Gene's Voice of Pack Foser, Starn had never been overly occupied with the forms of religion, but his faith was deep nevertheless. There was for him an essential rightness in the concept of the Ultimate Novo, the completely-sensed man of the future, the reason beyond reasons for man's existence in his present confused, troubled, and unfulfilled shapes. He was *trending* toward the Ultimate; that was his highest task.

And Starn had been specially blessed with a new sense, one that he had expected—with what he hoped was due humility—would be preserved in his offspring to bring the Ultimate Novo into being far sooner than most people would dare hope—perhaps while the name of Starn of Pack Foser was still recalled in the legends.

But he would produce no offspring now! That strand of barbed wire had seen to that!

The realization was numbingly bitter. Had the Sacred Gene forsaken him for unworthy pride? Or was his special sense of no value after all, something that should not be passed on?

And what of his wife, whose expectation of children was, if possible, stronger than his own?

But of course, he realized with a start, childlessness was a price he would have had to pay, regardless of that barbed wire, once he fell into the infidel hands of the Olsaperns. It was part of the Treatment. The Olsaperns did two things to men of the Packs taken in battle. They installed a psychological block that would prevent a released man from fighting the Olsaperns again. And they performed an operation to render him sterile, so he could breed no new enemies to attack their sons.

There was a certain comfort in this thought, because the danger of the Treatment was one that had to be faced by any man dedicated to the armed support of his Pack. That dedication made the danger acceptable, even to a special individual like Starn, because the Pack's heritable potential was more important to the Ultimate than that of any one of the Pack's members.

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The door of the hospital room opened and an Olsapern walked in —one of the few Starn had ever seen in the flesh, so he studied him curiously. He looked human enough, except that he was closely shaven instead of trimmed, which gave him an odd young-old look. Other than that and his pure-white clothing, he might have passed for a Pack man—a little large, perhaps, but so was Starn.

"Awake at last, huh?" grunted the Olsapern. "I'll get you some breakfast." He left without waiting for a reply.

Starn decided that, thanks to the skills of the Olsapern medics, he felt like getting up. He found clothing, and managed to figure out how to dress himself before the orderly returned.

The food was good despite its unfamiliar taste. When he had eaten he prowled around the windowless room, tried the door and found it locked, and finally sat down on the bed. He did not rise when the door opened to let in a middle-aged man, somewhat taller than himself, in gray jacket and trousers.

"You're Raid Leader Starn of Pack Foser," the man said, not making it a question.

Starn nodded.

"My name's Higgins. I'm Director of Domestic Defense," the visitor said.

The title meant little to Starn, except that he could not recall any ex-prisoners of the Olsaperns telling of encountering such a person. He said nothing.

"That raid of yours made a real glom!" the older man finally remarked.

After a pause, Starn said, in the best Book-English he could muster, "I was not conscious to witness the outcome."

"Speak your dialect!" Higgins said impatiently. "I can understand it. As for the outcome of your raid, none of your men got much farther than you did. Two of them, named Jaco and Houg, were killed, and another besides yourself was captured. His name is Huill. He was questioned and Treated and returned to your Pack a week ago."

"Seven days?" asked Starn. "How long have I been here?"

"About three weeks."

A long time to be unconscious! thought Starn.

"You really glommed things!" Higgins grunted.

Crossly Starn responded, "What's your complaint? You beat us off, didn't you?"

"Yeah, we beat *you* off, but not before you softened the mine's outer defenses, and spied some of our interior layout! And you Pack people, with your lousy telepaths, can't keep secrets! So when Nagister Nornt came along a day later he helped himself to weapons none of you should have, much less Nagister Nornt!"

Startled, Starn asked, "What has he done with the weapons?"

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"For one thing he's forced your Pack to hand over your wife! And he shot up two of our trading posts!"

Starn sat in stiff silence, trying to conceal his sick dismay.

"One consoling thought for you," the Olsapern added, "is that your wife was already pregnant."

"Cytherni pregnant?" gasped Starn.

"She was waiting until after the raid to tell you, and the telepaths were keeping her secret. Nornt will not make a slavie out of her as long as she's cooperative."

"You got this from Huill?"

"Partly. We made him talk freely."

"Where's Nornt now?"

"If I knew, I might not be here!" growled Higgins. "We've got to recover those weapons! And kill him if we get the chance! He's trouble now, and could be *big* trouble in the future!"

Starn had been about to demand his immediate release, so he could hunt Nornt down and rescue Cytherni. But the words "big trouble in the future" made him pause.

Yes, the Ultimate Novo would definitely be "big trouble in the future" for Higgins and all the obsolete Olsaperns! And though Starn wanted Cytherni back, and wanted to be the known father of his unborn child, the fact remained that he could give Cytherni no more children. And Nornt, distasteful though the thought might be, could! Also, Nornt could very well be in direct line to the Ultimate! Personal animosity had to be thrust aside for such a profound religious consideration.

He saw that Higgins was watching him with an air of almost friendly expectancy. A very clever fellow, this Higgins! The way he seemed to take for granted that Starn was his ally against Nornt was so convincing that Starn had been almost taken in! But Higgins had let slip a telling reminder that he was an Olsapern, while Starn and Nornt were Pack men.

It was a mistake, Starn decided, to even converse with this man. So he sat in silence.

Higgins fidgeted and growled, "No trafficking with the enemy, huh? O.K., if you're the kind who'll let his only child be destroyed by that creature Nornt, there's no point in talking!" He started for the door.

"Hold it!" snarled Starn. "Nornt won't destroy my child!"

Higgins turned. "No? Do you think he'll let your child grow up to challenge his own brood? Nornt believes in his own bloodline, not yours!"

"That's absurd! It's against the creed of the Sacred Gene!"

Higgins shrugged. "All I know is what I was told by the men who returned your friend Huill to Foser Compound. They parleyed with your Pack chief, who told them

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what Nornt had thought when he discovered his prize was pregnant. He doesn't mean to let your child grow up, creed or no creed! Oh, he'll make a pretense for a few years, to keep the child's mother content. But when the child's about six . . . well, it will 'wander off' some day and never be found! And not being a telepath, your wife won't learn the truth from Nornt!"

"That's the kind of life I ought to expect from degraded infidel scum!" roared Starn, surging to his feet and facing the bigger man.

But Higgins showed no anger nor intention to fight. He smiled, and shook his head sadly.

"I don't wish to argue religion with you, Raid Leader," he said.

"That would only raise animosity between us, and stir up side issues at a time when we ought to work together for a common cause. But let me point out a couple of facts. One, if I'm lying, you'll find that out soon enough when you return to your Compound, so the lies would have gained me nothing. Two, if Nagister Nornt is a step toward where your Sacred Gene wants humanity to go, then your Gene has chosen a most despicable vessel!"

"The ways of the Gene are mysterious to the eyes of man," Starn quoted sternly.

"They are that!" sighed Higgins. "So mysterious that he can lead you in reverse for centuries and you still think you're going forward!"

"The way of the Gene has no turning!" snapped Starn. He stared at the Olsapern in disgust. "Even your primitive Science should tell you that! The ancients knew that evolution moved steadily ahead, as relentless as death and time!"

"That was one of the errors of the Science Age," said Higgins easily. "They knew so much that they didn't know how much was still unknown! Don't try to tie me down to the beliefs of Science, Raid Leader! That age fell under its own weight, and good riddance! It was just another experience men should learn from, although many men, including your own ancestors, learned less than they should!

"There are relationships, Raid Leader, that ancient scientists never recognized. They specialized too much to see the broad interweavings of nature. For example, they never observed the linkages between certain unconscious levels of the mind and the information of heredity which is coded in DNA molecules. Consequently, they would have denied as readily as you do that the profound psychological shock which hit the human race when the Science Age toppled could have any direct effect on our evolutionary process. They would have said the extreme change in environment would make certain traits more suitable for survival than if the Science Age had continued, but this would merely be a change in the selection vector, not in the evolutionary force itself.

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"But we know differently today, Raid Leader. The state of the human mind *can* communicate with the genetic code structure, thereby changing the structure. And the collapse of human morale that went with the collapse of Science was a clear message—a signal to retreat! —to the codons of the vast majority of the race! About the only people who escaped the reversal were the few who realized that the Science Age *should* fall, that despite its victories it had turned reactionary and anticreative."

Higgins paused, then concluded thoughtfully, "I hope history will call our own time the Creative Age. Science could have been that, but despite its lip service it never really loved creativity, nor fostered the creative personality. Probably not one of its adults in a hundred was allowed to develop into effective creativity, and that alone was enough to doom the Science Age!"

Trembling with rage, Starn forced himself to sit down on the bed again. Such heresy was hard to endure! Especially that absurdity about the human mind influencing —actually changing!—DNA! As if the humble human intellect could not only *enter* the inviolable abode of the Sacred Gene in man, but could *pillage* there!

Still, Higgins had been right about one thing: the futility of religious argument between Pack man and Olsapern. And he might be right in his estimation of Nagister Nornt. The telehypnotic trader would indeed be a despicable vessel for the will of the Sacred Gene, particularly if he meant to subvert that will by murdering Starn's child.

At last Starn growled, "If you Olsaperns are so creative, why don't you create a way to catch Nagister Nornt?"

"Self-restraint," answered Higgins. "I'm not going to explain that, because it's something you shouldn't know. I'll only say that we limit ourselves, in our relations with the Pack people, in the materials and techniques we use. I'm pretty sure you won't believe that; otherwise I wouldn't have said even that much!"

"You're right, I don't!" grumbled Starn. "But never mind. You want me to find Nornt and kill him, don't you?"

Higgins nodded. "I'm prepared to give you a little help if you'll try."

"What kind of help?"

"Have you ever noticed that Treated men are poor hunters and fighters?" asked Higgins.

"No. The only ones I know are old men."

"Well, they are. The psychological block that keeps them from fighting us can't be strictly contained. It dims their combative spark generally. If you're going up against Nagister Nornt, you'll have a better chance if you're left Untreated. So here's my offer, Raid

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Leader: I'll release you without Treatment in return for your solemn oath to never participate in hostile action against normal—against the Old Sapiens as you call us—in the future."

Starn gave a grunt of disbelief. "You can't break your rules like that!"

"Rules are useful in ordinary situations," replied Higgins. "They are meant to be broken when an emergency demands radical action."

This was a strange attitude toward rules, but it was of no concern to Starn. The offer was one he felt he could honestly accept. "I solemnly promise not to war against the Olsaperns in the future," he said.

"Good! Now let's get you home! And this time, for pity's sake, follow your own ideas when you go after Nornt! Don't let anybody sidetrack you the way they did before!"

"Huh? Who sidetracked me? How?" demanded Starn.

"Your Pack chief. He insisted that you work with the Pack instead of going after Nornt as soon as you were aware of the danger! From what I've learned of this so-called 'surprise sense' of yours, I'm pretty sure you could have killed him then, while he was wounded and confused. All this glom would have been avoided!"

Starn stared at the man. Higgins was full of surprises, himself! He all but admitted the Olsaperns' inability to track down Nornt; he broke a basic rule to help Starn do the job instead; and now he seemed to be half-praising a Novo sense! But then the Olsaperns lacked a religion of their own, in opposition to that of the Packs. They had a sort of nonreligion. And maybe a nonreligion wasn't of much help in keeping a man's thinking straight. Or maybe the Olsaperns were finally falling apart, as they were destined to do sooner or later, anyway.

But Starn found Higgins' advice in accord with his own thinking, so he nodded. "I wished many times that I had gone after Nornt immediately. If I had settled everything then, Cytherni and I would still be like we were."

"I don't know about that," frowned Higgins. "I think you could have killed him, but he would probably have finished you while you were doing it! What I'm saying is that this whole glom would have been avoided, which would have suited me fine!"

V

Starn returned to Foser Compound for two days, just long enough to pay his respects to his parents and The Foser and to rearm himself. He needed a telepathic companion, and was pleased when Huill volunteered. He had learned that Huill had been captured by the Olsaperns because he had stayed at the electric fence, trying to free

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Starn, until it was too late to escape. Even though Huill had been Treated, Starn felt high confidence in him.

They set out on horseback, following Nornt to the south. Trailing the trader, which the Olsaperns had found all but impossible, was no job at all for them. They could ask friendly questions and get friendly answers from the folk who lived along the way. Nornt was not trying to conceal his tracks. He was trading as he went, in his usual manner. The telepaths Huill communicated with generally knew where Nornt intended to make his next few stops, but he was avoiding thoughts of his winter destination.

"He's worrying everybody," remarked Huill after they were several days on the road. "They don't like the way he's thinking. He wants . . . *everything!* He was vaguely like that all along, but since he captured those Olsapern weapons and took Cytherni, he's much worse! He thinks about having children who will be telehypnotics like himself, and about getting craftsmen together who can copy those weapons. He's figuring his sons and weapons will make him king of the world!"

Starn nodded grimly. "The Olsaperns seem to be afraid of something like that," he agreed.

"I thought they'd never quit probing at me about him and his Novo ability," complained Huill. "It went on for hours, and they got more worried, the more I told them! They made me talk a lot about you, too."

"I can imagine," said Starn.

"But your Novo ability didn't worry them. It just aroused their curiosity, because it was something they had never heard of before."

"Isn't Nornt's a new one, too?" Starn asked.

"They don't think so . . . well, of course, you know they don't think *any* Novo senses are really new, and that people had them back when we were still almost like the apes a million years ago. But they think there have been people with a little of what Nornt has in historical times—a combination of telepathy and hypnotic force. They think men like Alexander, Hitler, Rasputin, Barstokee and Quillet had touches of it."

"All those men were supposed to be crazy," Starn remarked.

"And you think Nornt isn't!" said Huill. "The Olsaperns call him a megalomaniac."

"They seem to know all about him, except how to catch him," Starn remarked wryly.

"They're a knowing bunch of people," replied Huill seriously. "Of course, they're wrong about a lot of things, too, like thinking we're subhuman and that the Novo senses aren't worth studying, much less having. But you know what, Starn?"

"What?"

"One of the Olsaperns who ques-

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tioned me would be a telepath if he could let himself. He had the sense; I could feel the shape of it in him. But, somehow, he couldn't use it at all. I guess because if he could, that would've made him a Pack man."

The mountains slanted eastward to the south and Nornt's trail gradually climbed into the higher foothills. Starn had been thinking for days about possible strategies of attack, but as he and Huill approached maximum telepathic range of the trader he dropped these thoughts. Instead, he concentrated on getting into a position where he and Huill would have flexibility of action—where his special sense would have plenty of room in which to work.

The foothills seemed right for this. They were almost empty of people, and provided a variety of covers and obstacles, without fettering choices the way high mountains could.

He was under no delusion that victory was assured. Nornt had around twenty slavies to throw into the fight, and he would not hesitate to expose them to any risk imaginable to save himself.

But in compensation, Starn had his advantage of surprise. This was no small thing in conflicts where full telepathic knowledge of the opponents' plans and strategies was taken for granted. As Raid Leader of Pack Foser, Starn's unanticipated actions and decisions had often given his men a more than momentary advantage, because of the time required for the enemy to shift forces to meet a totally unexpected situation.

They were riding up a thickly-wooded valley, following the bed of an ancient highway, when Huill made contact with Nornt's rear guard. "Three of them!" he reported. "About half a mile ahead of us and a mile behind the main train with one telepathic relay between them! They're on horseback!"

"Let's take them!" snapped Starn, pushing his mount into a gallop.

Huill stayed alongside him. He chuckled. "Nornt didn't expect us! He's in a panic . . . Something about getting to Pile-Up Mountain . . . Hey, guess what? He premotes the Olsaperns are in this with us! Instead of running he's driving his wagons off the road to get them out of sight of Olsapern fliers!"

"Why does he think that? Can't he read us?"

"Yeah, but he thinks we could be leading the Olsaperns to him without us knowing about it! He figures they made you trackable somehow while you were captured!"

It was a strange but possible notion which Starn wondered about briefly and dismissed. There were more urgent matters to think of.

"Can we overtake the rear guard before they reach the wagons?" he asked.

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"I think so. He's making them slow up to hold us back while he fortifies himself. He's trying to get the Olsapern guns set up! Hey, the rear guard's turned off to the west! Nornt figures we'll either have to follow them down or take a chance of having them come in behind us!"

"He's right," said Starn grimly. "We follow the rear guards. Lead the way!"

A short distance farther Huill swung off to the right in the track of the three riders. Meanwhile, he reported, Nornt was deploying his men in defensive positions.

"Can you read Cytherni?" asked Starn.

"Indirectly, yes. She's all right. He's still leaving her alone in return for her good behavior. She doesn't know what's scaring him . . . doesn't know you're here."

"What about the men we're chasing?"

"They're riding hard, and Nornt's looking for a good place for them to make a stand." A few minutes passed. "Stop!" yelled Huill.

"They've ridden out of range! No need to chase them any farther."

"How'd they outdistance us?" Starn demanded.

"Not us! I mean they're out of Nornt's range! They're not his men any longer! And not our enemies . . . not much use to themselves either!" Huill looked a bit sick from what he was seeing in the ex-slavies' minds. "They'll die soon if somebody doesn't find them and take them in."

"Let's head back," Starn ordered. They turned their horses and he asked, "Why did he let them get away?"

"He didn't intend to. It's hard to judge telepathic range when you travel twisted roads like these. He's down to seventeen men now."

Starn nodded, wondering if he and Huill would have to fight them all before getting at Nornt.

"He sure means for us to!" said Huill. "He's trying to locate ten of them out where they can close in on us no matter where we strike!" He described the terrain between them and Nornt, and the placement of the defenders.

They were less than a mile from the wagons when Starn noticed a trail angling off to the left and apparently up a low ridge that paralleled the road. Without hesitation he swung his mount into the trail and up the ridge.

"He didn't notice this trail," informed Huill.

"I hoped he hadn't. How many men are in front of us?"

"Just four on the ridge. But those across the road are moving over to head us off . . . A steep bank in the road-cut's blocking them! They can't get up in time!"

Starn grinned. His sense was working with its usual success!

"Nornt's crazy-mad!" Huill reported gleefully. "You ought to

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read the things he's thinking about us! He's going to fight his men like maniacs!"

"Be ready to yell and jump for cover the instant one of them sees us," warned Starn.

Their horses galloped along the silent ridge, both men sharply alert.

"Jump!" Huill yelled suddenly.

Starn tensed but didn't jump. Instead he spurred his horse into a sudden sprint forward.

Gunfire spurted from the bushes ahead, and Starn heard an answering bark from Huill's long-gun. His surprise maneuver had fooled the defenders, though. At least two of them fired where he would have been if he had jumped, and the other two had shot at Huill. Before they could cock and re-aim he had ridden past them and leaped from his horse. They were caught between an enemy in front and an enemy behind.

His first shot downed the only slavie in plain sight, while Huill yelled hoarsely, telling him there were two left and their locations. Starn stayed low, making swift moves as his sense inspired him. The slavies took several shots, all aimed at him as far as he could tell. Huill's gun spoke twice more giving him covering fire. Finally he brought a slavie into plain view and shot him through the chest as he was raising his gun.

"The last one's taking off down the south slope!" called Huill in a tight voice.

Is Huill hurt? Starn wondered, dashing after the slavie.

"In the leg, just as I jumped!" Huill yelled the reply. "Get him and hurry back!"

Starn put caution aside as he dashed after his quarry. When he was halfway down the hillside and approaching a rocky bald area he heard Huill's distant bellow. *"To your left!"*

Starn dropped on his backside to slide down a pebbly stretch while his eyes searched for the enemy. A spurt of gunfire, aimed too high, revealed the man, and Starn threw a pistol shot at him. The man rolled out of his hiding place with dying hands clutching his stomach.

"They're up the bank!" Starn heard Huill's dim call.

Hurriedly he started back, losing his footing once on the loose pebbles. He had not gone far when he heard Huill shout, *"They're on me!"* A volley of shots rang out.

"Huill!" he called in the ensuing silence.

No answer.

Without hesitation but with deep sorrow, Starn turned left toward the wagons, fighting his way through the undergrowth at a dead run. Telepathically blind now, his only hope was to bull and sense his way through to Nornt, and kill the man before the slavies could kill him. From what Huill had said of the terrain, the wagons and their master had to be somewhere below the south end of the ridge. If he

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could find a high spot that overlooked them . . .

He could hear the slavies thrashing through the woods some distance to his rear and to his right. At best, he had only a half-minute lead on them. He would have to hurry if he—

A long-gun spurted from behind a tree just ahead of him and a slug hit his left shoulder, knocking him sprawling. He clung to his rifle but was lying on top of it. Before he could get it into action the slavie stepped out of hiding and shot him in the right forearm.

"I gave your friend a clean death, Starn the Olsaperns' eunuch!" said the slavie, voicing Nornt's thoughts with an expressionless face. "He was a mere telepath who never did me any real harm. But you and that quick knife of yours have caused me much pain! During the next few minutes, before you die, you're going to suffer as much as I have in the past two months!"

The slavie's gun fired again, and the slug tore into Starn's left ankle. The other slavies had arrived by then, and a couple of them got out their knives and began methodically slashing and stabbing Starn's limbs and body, careful not to deliver any immediately fatal wounds, and pausing when he almost blacked out.

"You should see yourself, eunuch!" said the first slavie. "What a revolting shambles you are! Even your friends the Olsaperns couldn't patch your body now! Especially after we break your spine in a few places! Try to stay with us for this, eunuch! I don't want you to miss any of the fun!"

But when something heavy struck him in the small of the back, the torture ended for Starn.

VI

He was shocked into sudden wakefulness. Overhead was a white ceiling he had seen before, and at one side was the remembered face of the Olsapern Higgins. Two white-clad medics were detaching electrodes from his chest and wheeling a machine away from his bedside.

"Sorry we couldn't get there fast enough to save more of you, Starn," said Higgins. "And there was nothing we could do for your friend Huill. He was shot through the head. But we arrived in time to keep them from damaging your brain, and everything else is replaceable."

Starn regarded him steadily and replied, "I'm not grateful for this, Olsapern."

Higgins muttered "I suppose not," and turned away for a moment. Then he asked, "How do you feel?"

"Like I ought to be dead," grunted Starn. But he sat up with a feeling of dreamy detachment and looked down at his bare body.

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No, not his body, but a fair copy. At least it wasn't the patchwork of grafts he expected to see. But on the other hand, it was not quite real human flesh. And it definitely did not *feel* real. The sensations of touch, when he experimentally squeezed his left arm, were strange. His brain got the message all right: that his forearm was being squeezed by his right hand. But it was as if the message was in a new language with a new sound. There was no suggestion of pain, for one thing.

"What is this?" he asked.

"Your body? It's an artificial structure, a sort of machine of pseudo-flesh and bone. I'm sorry it has to be artificial. We can regenerate your entire body—your brain contains all the information needed for that, of course—but that takes time we don't have. Nagister Nornt is still at large, and your wife is still in his hands."

"She can stay there," retorted Starn dully. "He defeated me in a fair fight—his Novo abilities against mine. That ends it."

Higgins frowned thoughtfully. "You mean he's proved himself your superior, and has earned the privilege of mating with your wife, and destroying your own child, without further interference from you," he said.

Starn winced but nodded.

"That's the will of your Sacred Gene, so to speak."

Again Starn nodded.

Higgins grunted in disgust. "I halfway anticipated this! How do you like that? I anticipated your attitude without being a premonitor! Get some clothes on! I'm sending you on a little trip!"

A few minutes later Starn was put aboard a flier which carried him south almost to the Hard Line that guarded the Olsapern border. The craft set down at a small complex of buildings and the pilot ushered him into one of them. An older Olsapern that Starn had seen before greeted him.

"My name's Richhold, and I'm an anthropologist if that means anything to you," the man said. "I understand I'm supposed to give you an illustrated lecture, in the company of an old friend of yours. Holden, send that telepath in."

The pilot went out and a few moments later Rob of Pack Foser entered.

"Rob!" exclaimed Starn. "It's good to see you!"

Rob stared at him, gasped, and backed away. "W-what are you?" he stuttered in terror.

"Why . . . I'm Starn, Rob! I know I don't look exactly like I did, but I'm still me!"

"But I c-can't read you! I can't even know you're there!"

"You mean I'm a blank?" asked Starn in amazement.

Rob gulped and nodded.

Starn could guess what must have happened. The Olsaperns had some means of screening a brain

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against telepathy, and they had built the screen into his artificial skull. This was a numbing thought, because Starn had never heard of such a thing, and was, therefore, inclined to doubt if it could have come out of the Science Age. If it had, it would have been used before now, and there would be legends about it.

And it was completely unacceptable that either the ancient scientists or their diehard followers, the Olsaperns, had devised a counter to telepathy that even outdid his own Gene-given sense!

The Olsapern Richhold fidgeted impatiently while Starn and Rob discussed these thoughts. "Never mind that!" the old man snapped at last. "You don't know what you're talking about, anyway! You're here to learn a few things, and this telepath was talked into coming so he could verify that what I tell you is the truth, so far as I know it. So let's get started!"

He waved his hand and a wall of the room vanished to display a series of projections and exhibits. Richhold spoke boredly about what was being shown, as if this were elementary stuff that he had recounted a hundred times before.

The lecture proceeded backward through the history of man, starting with a typical Olsapern figure and modifying it step by step, back to a creature Richhold called "the link." Each modification was justified by the replica of a skeleton which he said originated in the era being described.

"You don't see people today who look like the link," said Richhold when the backward journey was completed. "But let's come forward and look again at some later models."

The projection revealed a squat, scraggly-haired creature with a near-gorilla face and a sharply-receding forehead. "Higgins said he wanted you to take a good look at this one. Resemble anyone you know?"

Starn grimaced with annoyance but nodded. Higgins' intentions in exposing him to this lecture were obvious, because the projection looked like Nornt, except Nornt's forehead was higher and straighter.

"All right," said Richhold, "let's move several thousand years closer to the present." He chuckled and glanced at Rob when the new image appeared.

"My head's not that low!" snarled the telepath.

"True," agreed Richhold, "but look at the shape of your jaw, and the form and stance of your body!"

"Hold on!" said Starn. "People come in all shapes and sizes, and you know it! Higgins is a large man; you're small! The pilot who brought me here is thin; one of the men at the hospital is fat! And your faces and heads have different shapes!"

"We're dealing with averages!" snapped Richhold crossly.

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"But that's not all!" said Starn. "How do you get off calling us apemen when you can see our brains are much bigger than those you've been showing us?"

Richhold shrugged. "Cave bats go blind in a comparatively few generations, but keep their eyes much longer. Land animals which return to live in the sea keep vestiges of their legs for millions of years, and seldom lose their lungs at all. So in man the brain grew and developed slowly as he became more advanced; now the portion of the race that is regressing isn't losing its big brain immediately. You won't be exactly the same on the way down as you were on the way up. You'll carry remembrances of what you were. But the big brain will finally go."

"You claim to be so all-knowing about the direction we're going," sneered Starn, "but your whole theory depends on that stupid idea Higgins told me about—that the unconscious mind can communicate with the chromosomes. How do you know that nuclear radiation didn't cause the mutations of the Pack men, aside from the ones authored by the Sacred Gene to give us our senses? There was radiation when Science fell, wasn't there?"

"Radiation had its effects, certainly," rapped Richhold, "but they were doubtless random in direction, seldom even viable. Don't argue with facts, young man! There is evidence in plenty that Pack mutations have been in a regressive direction.

"As for that 'stupid idea' as you call it, of a linkage between the unconscious and the genetic structure, its existence has been rigorously demonstrated by a means I can't expect you to understand. The ancients almost discovered it, but they were looking in the wrong direction and for something else at that time. They were trying to find a cure for the aging process, of all things!"

"They discovered that the cells of normal human tissue can subdivide through only sixty cell-generations or thereabouts, before the cells lose their functionality and die out. They were very interested in discovering the reason for this, hoping thereby to make their cells, and thus themselves, practically immortal.

"The reason is obvious, of course to anyone who knows communication theory. In repeated transmissions any message suffers a loss of information. That's entropy, young man, and it's unavoidable. When a cell divides, it must, in a real sense, transmit its genetic message to both new cells. The information loss is unimportant through many subdivisions, but becomes critical in human cells after about fifty generations. After that the cells, the tissues, the human body in general, must go downhill at a rather rapid rate.

"But instead of asking why human cells deteriorate, the ancients

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should have been asking a far more important question: Why do other types of living cells *fail* to deteriorate? Why do one-celled animals go on subdividing for millions of years without apparent loss of genetic information? Is the code transmission mechanism in these creatures perfectly error-free?

"The answer is that it can't be; no such process is perfect! There has to be a corrective agent, something completely outside all the redundancies and other corrective processes of the transmission mechanism itself, something that 'knows' when the message is getting garbled, and can step in and clear it up.

"The word 'consciousness' is as good a description for that agent as I can expect you to understand. One-celled animals have it. So do many kinds of cells in plants, and in other animals.

"But it is missing in the cells of humans, and in other animals that stop growing when they reach maturity. Why is it missing? Because in these creatures 'consciousness' has become concentrated in special organs, to serve the needs of the animal as a whole. This is a kind of sacrifice cells are often called on to make when they become components of a more complex organism. They give up their abilities to respond as individuals to environmental stimuli—to light, to heat, to contact, even to the presence of nourishment.

"But that old cellular consciousness of the genetic message is not completely lost when the consciousness becomes concentrated. It is still there, almost totally buried in the unconscious mind of the human, but functional to a limited extent. The mind can direct it at times, provided the mind maintains the same desire with sufficient intensity through a sufficiency of human generations.

"Thus, when the post-Science environment told the average human *'Retreat!'* the message got through. And your genes retreated! Back to primitivism!"

Starn gazed at Richhold for a long moment after the scientist fell silent. Then he said, "This 'consciousness' you speak of sounds to me like an Olsapern version of the Sacred Gene. What does it do that the Sacred Gene cannot?"

"Nothing," shrugged Richhold. "The only difference is that the 'consciousness' is real. Probably so!"

Starn glanced a question at Rob, but got no response. He had forgotten the telepath couldn't read him. "Does he believe all that nonsense?" he had to ask aloud.

Rob nodded. "As far as he knows, he's telling it straight. And the Olsaperns think he's very wise about such things." His voice took on a whining tone. "He's got me all confused! I can't go back to the Pack halfway believing the stuff he's said! They'd kick me out!"

"We're not novices in dealing with such trivial mental problems!"

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snorted Richhold. "You'll be hypnoed into forgetting everything you've experienced here! It's a shame in a way to send you back as ignorant as you came, but that's our policy, and a necessary one."

Rob looked relieved.

The stunning thing to Starn was not that Rob had found the mind of Richhold honest, but that, after looking behind the man's thoughts as they were expressed, the telepath had been forced to believe them!—or if not to believe, then at least to doubt the eternal truths of the Sacred Gene and the Ultimate Novo!

The whole matter was so completely absurd!

In a mental turmoil, he scarcely realized his interview with Richhold was over, and that Rob was rather nervously shaking his hand and saying, "Great Gene, Starn, I'm glad I won't have to remember this, or seeing you all vacant inside!"

He remained in a distracted state all the way back to the hospital-prison, where he was vaguely relieved not to find Higgins waiting for him in his room. He was in no condition to talk to the Olsapern or to anybody else.

VII

Higgins stayed away for two days, until Starn came out of his shocked stupor. When he appeared, Starn glowered at him.

"I've got one question to ask you Olsaperns, Higgins: *Where do you think you're going?* You have no belief in the Gene, so how do you find any purpose or direction in your lives? What are you good for?"

Higgins smiled at him. "Old Richhold really shook you up, didn't he? Where are we going? The same place you think *you* are! Toward a more advanced human species! The difference is that we define the superman quite a bit differently than you.

"Take these Novo senses, for instance. Did Richhold tell you the theory that apemen had some of them a million years ago?"

"I've heard that one before," growled Starn.

"Of course, it's only a theory and can't be proved. Some of Richhold's colleagues say the Novo senses are just make-work activity for your left-over big brains, but others suspect that the dawn men needed those special senses to survive in a savage environment, full of enemies stronger and faster—and at that time probably just as bright—than they were.

"That may be right. At any rate, the Novo senses can't be the next step up for man, because they make a specialist out of him! Man's whole strength is his *lack* of specialty, his ability to find ways to live anywhere, eat anything, do anything! Specialists are so loaded with their special equipment that they can't change! They're static, inflexible!

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"What would your Ultimate Novo be, Starn? Telepathic, premonitorial, perceptional, and maybe hypnotic like Nornt? All right, what would he *do* with all those abilities? Would he use them to build a marvelous civilization?"

"Certainly!" replied Starn.

"I'm not so sure he would," chuckled Higgins, "but let's say you're right. He builds his Ultimate civilization, but what does he do *then?*"

"He *lives* in it, naturally!"

"Forever?"

"Well . . ." Starn hesitated, suspecting a trap.

"Ah, there's the rub!" trumpeted Higgins. "Forever's a long time! And what will keep your Ultimate Novo from asking himself the same question you asked me? Where will *he* be going, Starn?"

"Perhaps there will be more Novo senses to develop, senses we don't know about now," Starn replied.

"Ah! Then he won't be the Ultimate until he's acquired them all! You're begging the question! Once the *ultimate* Ultimate comes, where does he go from there?"

"Why do you think he'll have to go anywhere?" stormed Starn. "We don't know what he'll be like! Maybe he wouldn't *need* a purpose in life of the kind we understand!"

"Very good!" approved Higgins wryly. "That's the kind of unanswerable supposition that makes further debate futile! But it leaves one question open: Is such an unstriving Ultimate man the kind of goal you striving Pack people consider worthy of your centuries of toil and deprivation? Can you really devote yourself to achieving that kind of result?"

Starn shrugged. What was the use of arguing with an Olsapern who thought he knew all the answers?

After a pause Higgins went on: "Striving, like generalizing, is a basic feature of man, Starn. Make man a specialist and he'll be less than human. And if something ever stopped him from striving the same thing would happen.

"You call us infidels because we don't take your Sacred Gene seriously, except as a scientific principle. And you consider us obsolete, partly because we don't have Novo senses but more because we refuse to disdain the Science Age as an era of rampant evil. Certainly the Science Age brought its own destruction with it, and nearly destroyed man in the process! But that was because it was too much like the civilization you dream of for your Ultimate Novo! It built itself a super structure of interdependent techniques and specialties, social orders, and economic mores that had to become increasingly rigid simply to support itself, the bigger and more complex it grew. It couldn't *create* answers to the kinds of problems it faced because it was unable to accept those problems. Its rigidity led to its final ruin when it had to change, but couldn't.

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"We're not trying to recreate the Science Age, Starn! We know of too many things that were wrong with it! But we do recognize that science was a tremendous step forward for man. Whereas your people have opted for its total rejection, we have tried to retain it, not as a divine revelation or a way of life never to be modified, but as what it was—a step forward.

"In the last analysis, Starn, the mistake of the Science Age was the same one you're guilty of, and the same one the Christian priests made in pre-Science times—the same one practically all civilization-builders have made. You strive for an end to strife—for permanence, either now or in some dreamed-of future, despite the fact that permanence is against the nature of man and the world."

Starn remarked, "Then you think man's real future lies in ceaseless change?"

"Yes."

"But you're opposed to change in man himself!" Starn shot back. "You find excuses to treat Novo senses as a dead end, and you refuse to see them when you have them yourselves! You may be right about a lot of things, but you're wrong about the Packs being subhuman, and Novo senses worthless!"

"*Why* are we wrong? Where's the flaw in our picture?"

"I don't know," Starn admitted angrily, "*but the flaw is there somewhere!*"

Higgins laughed and replied patiently, "What's the better means of communication, Starn, a language or telepathy? Remember that telepathy has no privacy, as Nornt recently demonstrated to your Pack's dismay. Remember, too, that language can be transmitted over vast distances, and that if it is well-structured and effectively used, it can carry almost precisely the message the sender intends, with no unwanted and perhaps embarrassing side-disclosures."

Starn recalled with a slight wince the anguish of his childhood, when he had to force himself to control his odd thoughts and wild daydreams to avoid the censuring laughter of his telepathic playmates. Of course his childish thoughts were probably worthless, but . . .

But Higgins was continuing: "What's the better means of exploring your surroundings, Starn, special devices we can imagine and create, or your percepting? You've noticed, I suppose, that a perceptor detects only objects in motion, and usually only objects moving toward him. Did you know that your weak 'danger sense' is a form of perception that works only when something is moving up behind you? You're not much of a Novo, Starn, with just that one weak sense."

Starn tended to forget his "danger sense" because it proved useful to him so seldom. But Higgins was wrong in saying that was his only Novo sense. He was about to pro-

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test when Higgins again interrupted his train of thought.

"And what about premonitoring? Isn't it far better to understand the functionings of man and nature, so well as to predict what they are likely to do next, than to depend on the spotty, over-emotionalized glimpses of the future your premonitors can produce?

"And the same is true, I think, of any other Novo sense you might propose. With a little effort and creative imagination, we can come up with something better! And with us, it's an open-ended process! Creative imagination knows no ultimate limit, Starn, and has no ultimate goal. It just keeps going! If anything can give man unending existence in a changing universe, his creative mind will do it!"

When Starn finally replied, his question sounded like a non sequitur, but Higgins did not treat it as such.

"Why didn't you let me die?"

The Olsapern smiled. "Because I was using my creative imagination! Sure, we could dream up some means of hunting Nornt down without your help, but that sort of dreaming can take time, and we want Nornt stopped quickly.

"As I told you before, there are methods we refrain from using. I suppose I can explain that to you now. We try not to reveal our capabilities too fully to the Pack people. We use almost nothing in our defenses that was not known to the Science Age, and the only members of our society who allow themselves within reading distance of your telepaths are . . . well, they're our lower-intelligence citizens who don't know—and don't care to learn—just what our capabilities are. You remember that Rob's memories of contact with Richhold had to be erased? Also, it would be bad for the Packs to learn of your artificial body.

"The reason for all this is that we don't want to give the Pack people's morale another shock that would hasten their evolutionary retreat! The past has made them all too susceptible to that kind of damage!

"So you can see why you're the weapon we need, Starn. If you kill Nornt, we will not need to display ourselves to the detriment of the Pack people. Also, we won't run the risk of making a martyr of that madman, which is something else we want to avoid!

"We think your wife and child are worth saving, Starn. Are you with us?"

Starn was tempted. He realized that his religious faith had been seriously eroded by Richhold and Higgins. He no longer felt he would be morally wrong in continuing his battle with a man who had once defeated him fairly. And the sense of deep depression with which he had awakened in his artificial body was giving away to a restlessness, a desire to be doing *something*—anything at all.

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But he shrugged. "What would be the use? What happened before would happen again. I'm the same man Nornt has proved he can beat."

"Not quite," replied Higgins. "Rob couldn't read you, remember! You were a blank to him. You would be the same to Nornt and his slavies! He wouldn't even know you were around unless someone was eyeballing you! And he'll find this body of yours isn't easy to kill!"

Starn considered this. What Higgins said was probably true, and that would make a fight with Nornt a very unusual affair! It would be more like a hunt than a battle. The old woodman skills of following sign and tracking would be more critical, perhaps, than the Novo senses. To a man who had always enjoyed hunting, it was an appealing picture.

Slowly he nodded.

"Fine!" exclaimed Higgins. "Now, there's just one problem that can't be solved the way we did before. Your people won't accept you now, because you can't be read—and we don't want them in contact with you, anyway. So the question is, how do we locate Nornt?"

"I think I know where he is," said Starn thoughtfully. "Something Huill caught from his thoughts when we first came in range and frightened him. He thought about Pile-Up Mountain. I'll look for him there."

VIII

Pile-Up Mountain was a lonely peak at the end of a minor offshoot of the main range. It stood above a low rolling countryside that, while thickly wooded and certainly fertile, was seldom trod by men. The area had an evil repute, and was the subject of numerous ugly legends. Probably some time in the dim centuries of the past, perhaps all the way back in the years of terror following the fall of Science, deeds of great horror had happened thereabouts.

In the pre-dawn of a crisp winter morning a dark Olsapern flier dropped onto a bald strip of old roadway three miles from the mountain, and Starn leaped to the ground. The flier soared away, to follow, from great altitude, Starn's fortunes through special devices included in his artificial body.

Starn walked rapidly toward the mountain, taking advantage of what darkness was left to get close while there was little risk of being seen. The old roadway brought him close under the mountain's steep eastern slope, where he turned into the thick underbrush and began a slow ascent. By then there was enough light to disclose footprints or other signs of man. He did not unsling his longgun, but carried at the ready the weapon he preferred under the circumstances: a powerful bow.

He reached the sheer rockwall that stood around the summit without seeing a trace of human trail. This was not surprising; assuming that Nornt really was somewhere about, he would have no need to

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send his slavies out on sentry patrols. He could trust telepathy to detect any nearby intruders, with perhaps one lookout on the summit to watch for fires and smoke beyond telepathic range.

There would be a trail somewhere, through a break in the rockwall, leading to the summit. Starn began working his way along the foot of the cliff.

He circled almost halfway around the peak before hitting the path. Then he paused in thought. Should he climb to the summit and kill the lookout? If nothing else, the mysterious death of the slavie would scare Nornt, and a frightened opponent was seldom a clever opponent.

The decision was taken out of his hands by the sound of footsteps coming up the trail—the morning relief on his way up to replace the night lookout. Starn readied his bow, crouched out of sight behind some brush, and waited.

Starn did not shoot at first sight. He waited until he recognized the slack emptiness of face that marked the man for what he was. Then Starn put an arrow through his throat. The slavie fell, tumbled a few yards down the slope, and lay still.

Starn readied another arrow and waited. Only a few minutes passed before the lookout came rushing down the path, sent by Nornt to learn what accident had befallen his relief. Starn waited until he reached the fallen man, and stood gazing down at him, before zinging an arrow at his back. But this slavie—or perhaps Nornt himself through his presence in the slavie's mind—had a danger sense similar to Starn's. The slavie jumped sideways almost as soon as the arrow flew and took it in his sleeve. He whirled with long gun raised and fired at Starn, who had dropped to the ground as he brought his own gun into play.

The slavie did not shoot a second time. He simply stared at Starn until a slug smashed through his heart.

Nornt was just as shocked as Rob had been, Starn guessed, to see a blank man, particularly an enemy probably presumed dead who rose from the ground to kill his slavies. The thing to do was give him no time to recover his wits. With long paces Starn hurried down the trail.

Ghosts were not prominent in Pack religion, since it was not based on expectations of a surviving personal soul. But there were tales of certain spirits of departed men, particularly men whose deaths had been unusually painful and brutal, which walked in evil places on the earth. And Pile-Up Mountain was supposedly an evil place. Nornt probably had little belief in such tales; else he would not have chosen the spot as his hideaway. But if he could be made uncertain, just for a little while, the result could be most important to Starn.

He rounded a curve in the trail

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and confronted two slavies. He raised his gun and fired, killing one, then leaped sideways. But Nornt had learned something from his previous brushes with Starn. The other slavie did not shoot immediately, but waited until the leap was completed. His slug ploughed into Starn's chest, knocking him backwards. With his gun recocked, he sat up and plugged the slavie in the act of rushing forward.

Starn had little time for curiosity about his wound, from which a blood-red oil was oozing. The point was that he was still functioning, so no vital part had been hit. The Olsaperns had provided some sticky repair patches for such eventualities, so he pressed one over the hole and continued down the trail.

As soon as the terrain opened enough he left the path and crept through the brush, to guard against being caught in an ambush. Moving slowly, he went some three hundred yards before his danger sense awakened suddenly to make him whirl and hit the dirt. He had bypassed an ambush, and now the slavies were spreading out through the woods behind him. He could not see them, but the crackling of bushes told the story. Cautiously he readied his bow and waited until the one headed in his direction came into view. He shot him through the heart.

The noise of the other slavies increased as their search became more frantic, but, as Starn had hoped, they did not close in on his position. Since telepathy was only roughly directional, it could actually be confusing when people were spread out and hidden from each other in unfamiliar surroundings. Neither Nornt nor the other slavies knew just where the dead one had been in relation to them, and Starn's silent arrow had not betrayed his position.

Cautiously he crept away from the sound of the hunt, and continued in the direction he had been going, roughly parallel to the trail.

The path curved back to him, and after peering up and down he stepped into the open and increased his speed. The slavies he had slipped past would soon be brought scurrying back to provide Nornt a close defense, and he had to stay ahead of them.

He came upon the tunnel mouth suddenly, and sprinted for cover through a hail of slugs that spurted from an Olsapern weapon concealed within the dark opening. He was hit three times, twice in the body and once in the left arm. The arm was obviously broken, and he had no time for complicated repairs. He discarded his bow—useless to a one-armed man—and edged with a stumbling gait to a spot from which he could approach the tunnel from the side, unseen until he stepped into the opening itself. This maneuver would have brought defenders hurrying into the open if he had been readable, but as a telepathic blank he got away with it.

He entered the tunnel in a stagger-

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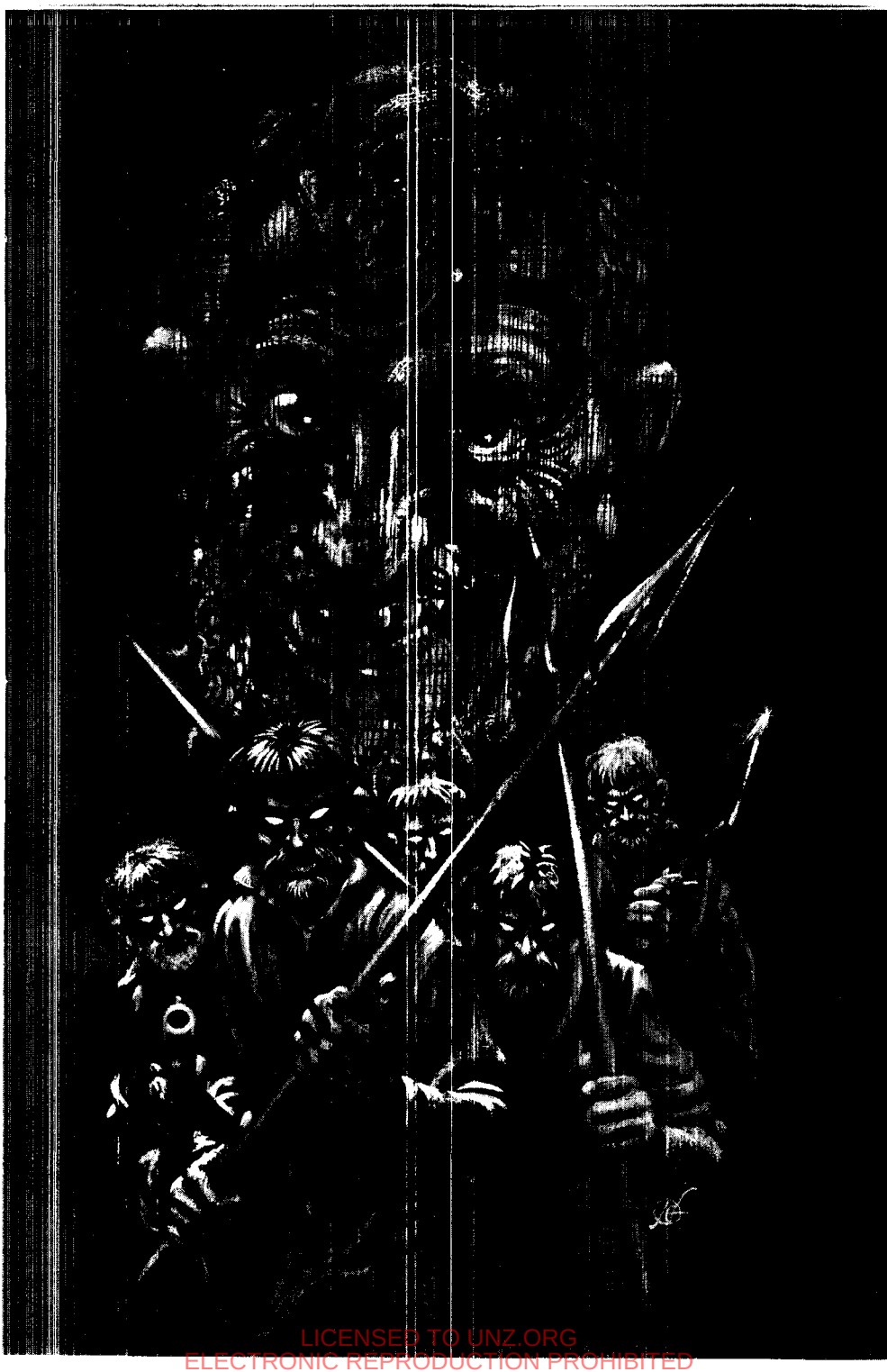

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ing run and pushed past the Olsapern weapon and the slavie operating it, collecting two more slugs in the lower part of his body. He shot the slavie down and hastily examined the weapon. The Olsaperns had explained the functioning of these automatic guns to him, and it was easy to adjust this one to fire at anybody approaching or entering the tunnel.

He noticed he was leaking red oil quite rapidly now, and his legs were working erratically. Something in his body had been damaged by those last slugs. But he had escaped head wounds, and he guessed his strange body-machine would keep working in some fashion as long as his brain was undamaged. He turned and limped deeper into the tunnel, which was dimly lit by occasional oil lamps perched in recesses high in the walls.

"Starn of Pack Foser!" the voice of a female slavie called from some distance ahead. *"Leave immediately or I will kill your pregnant wife!"*

"That will unite her with me, Nagister Nornt!" he responded hollowly. "Go ahead!"

The voice blasphemed the Sacred Gene and fell silent. Starn moved ahead as fast as he could, his eyes and ears alert for possible attacks from the dark side tunnels. Evidently the carved-out underground labyrinth was huge, and he could not guess its original purpose. He followed the lamps which lighted the portion Nornt was using, guessing they would lead him finally to his enemy. A muffled rattle came from the Olsapern weapon back at the entrance, presumably halting the slavies who had followed him down the trail.

But there was enough trouble waiting for him just ahead, where he rounded an oblique turn and faced Nornt and his final line of defense less than one hundred feet away.

Two Olsapern guns opened fire and the slugs knocked him flat on his back. He had caught a glimpse of two slavie women operating them, of a third female armed with an ordinary long-gun, of the wild face of Nagister Nornt glaring hate at him, and behind them all a huddled form which he guessed was Cytherni.

He had rolled behind the angle in the wall, out of range of the guns. His body was riddled with holes! And the tunnel was totally silent, which hardly seemed likely, so his hearing was obviously knocked out. With a clumsy right hand he explored his head and found a gaping hole through his forehead. A slug had passed through the center of his skull, and even yet he was functioning after a fashion!

The Olsaperns must have placed his brain elsewhere in his body, but where he had no idea. He didn't seem to have enough unpunctured area *anywhere* to contain a cat's brain!

His sight was flickering on and

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off, and he knew he had little time left. He managed to drag himself erect and lurch forward, his long-gun up and ready for one final shot, and his body leaning into the hail of bullets.

He stumbled toward the spurting gunfire, forcing himself to keep moving as the slugs tore at his artificial flesh. He raised his wavering gun to aim at Nornt's frantic form, then hesitated as his sight flicked off. When his eyes came on again he adjusted his aim, but suddenly fell forward on his face when the Olsapern weapons stopped spurting at him. He was having trouble moving any part of himself, but finally managed to twist his head around so he could see what was happening.

The slavie women were slumped like discarded dolls behind their weapons. Nornt's mouth was open and frothy with screams Starn could not hear, and he cowered back in terror when Starn's eyes stared at him. Cytherni was moving. She took a long-gun from a limp slavie woman, raised it, and shot Nornt down. Then she gazed in horror at Starn for an instant before crumpling.

Starn tried to call out to her, but his voice was gone. Soon whatever life his artificial form had ever held was gone as well.

IX

The dreams went on and on.

Sometimes there were scenes; sometimes there were thoughts that strung themselves together into patterns that seemed to hold astonishing power, but these patterns were elusive. They were suddenly unrememberable when a dim awareness attempted to grasp and hold them.

Scenes and thoughts came and went.

He was fishing on the creekbank, and whirled to confront an approaching danger, and there was Nagister Nornt screaming soundlessly . . . A snake of steel was crumpling his left arm . . . His father was preaching at the Tenth-day service and was shouting: "Where is the flaw in our reasoning?" (No, it wasn't his father, it was Higgins.) He stood up and started to answer the question but couldn't remember what the question was . . . His body was being flexed—was this a dream—while it hung suspended between six glowing suns . . . He was with Huill swimming in the river and the water—so warm—swirled against his bare skin . . . He was arguing with Higgins . . . His mother was cooking breakfast, but he was too tired and sleepy to get out of bed . . . Music was weaving strange patterns and somebody was talking in Book-English . . .

There were more scenes, and some returned again and again. The elusive answers and the flexing and the music and the swirling water. The face of Higgins loomed over him against a smooth white ceiling and it said, "You're awake now."

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Starn sat up in bed, wondering how many more times this was going to happen in dream or reality, and realized that indeed he was awake.

He stared around the hospital room, trying to get the fantasies in his mind labeled as such and thrust aside, and to remember his last real moment of consciousness. It had to be in the tunnel, when Cytherni had killed Nornt, but that seemed so long ago! He had been in an artificial body which Nornt's slavies had shot up, and—

He looked up at Higgins with a sudden question. "Where was my brain?"

"Here in this building," the Olsapern replied. He grinned. "We finally got a bright idea on how to defeat a telepath! Nornt couldn't read a mind that wasn't even there! So we kept your brain safely bedded down here, but directing your body through a highly redundant system of transceivers. Nornt must have thought he was fighting a ghost!"

"That's what I tried to make him think," said Starn. "Otherwise he might have killed Cytherni. Is she all right?"

"Oh yes, she's fine! She and the baby will be in to see you shortly, but I wanted to look you over first. Do you feel normal now?"

"I suppose so," shrugged Starn.

"Still a faithful sheep of the Sacred Gene?"

Starn growled at the frivolous tone of the question, "After the way you've used me, Olsapern, I don't even have faith in my own death anymore!"

"Don't take it too hard, lad!" chuckled Higgins. "That's done with now! I'm not unsympathetic about your state of mind. You've lived through more weirdness than an ordinary Pack man could possibly endure. I'm not sure I could have stood it myself! But you've got an innate flexibility of mind, lad, that couldn't be stiffened by all the rigidities of Pack law and religion! Frankly, I envy you more than I sympathize with you!"

Starn shook his head at this puzzling speech. He got out of bed and looked around for clothes. "If you're through with me," he grumbled, "I want to get back to Foser Compound. Bring in my wife and . . . *baby did you say?*"

"That's right," nodded Higgins.

"But . . . but Cytherni was only . . . five months gone!"

"And your baby is now nearly a year old," agreed Higgins. "Quit hunting for clothes and go take a look at yourself in the mirror."

Starn glared at him, and then strode to the full-length mirror on the door. He gazed at his image for several minutes without speaking.

It was his own body, in perfect condition. He had his own left arm back, and . . . and he was a whole man again.

He realized Higgins once remark-

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ing that the brain contained all the information needed to reconstruct its body. No wonder those dreams had seemed so endless! They had lasted more than a year while his body was building.

The wonder of his discovery lessened as he stood gazing at his reflection, but his elation grew. He was beginning to remember—and grasp—some of those thoughts that had eluded him during his long dream-state. What he saw in the mirror fitted those thoughts precisely.

So far as his appearance was concerned, the kids in the Pack had been right. His posture was too erect, his shoulders too horizontal, his belly too flat, and his head too big for him to look like a Pack man. Physically, even allowing some spread for individual differences, he was thoroughly Olsapern!

And it didn't matter! Except that it supported his new thoughts. After all, he had two Novo senses, one major and one minor.

He thought of Cytherni's figure and frowned. In a purely feminine way, her form departed from the Pack norm in the same direction as his. She had shown no Novo senses . . . but then not every individual had to be living proof of his theory.

Almost to himself he remarked, "She couldn't have given Nornt children that resembled him."

"Your wife?" said Higgins. "Probably true. I have a theory that something deep in Nornt's genetic structure knew he had to be defeated. That Sacred Gene of yours abhors regression in the final analysis, and is trying to block wrong-way evolution among the Pack people. The combination of factors leading to environmental and psychosomatic shock when the Science Age collapsed is breaking up now, as the existence of you and your wife and son amply testify. Anyway, when Nornt chose his mate, something right in all his wrongness led him to pick a woman who could not possibly give birth to a telehypnotist. As I told you before, a rapport exists between genetic information and certain unconscious levels of the mind, so—"

"You always have a theory, don't you, Higgins?" Starn broke in impatiently. "A theory, and a framework of facts to hang it on. But somehow, Higgins, your theories always seem to know more than your facts do!"

Higgins shrugged. "That's the way knowledge advances, Starn. A lot of old information, plus a new bit or two, plus a few guesses about how the new bits fit in and what they mean. We keep in mind that our theories are just guesses. They don't get in the way of recognition of new information when it comes along. Not anymore. We stay flexible."

"You do, do you?" grunted Starn disdainfully. "Then tell me this: How is it that you've never theorized that the genetic shock effects

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of the fall of Science didn't end quickly, within a couple of generations after the event? The fall wouldn't be much of a shock to people who had no personal memory of it, would it? But as Richhold said, genetic changes don't come and go in one generation. If the Pack people were thrown back then, we could still be showing the effects in our shapes today."

Higgins looked a little surprised, but after a moment he nodded. "An expert in the field might argue with you on that. But I know no objection to the idea. Not that it matters either way . . ."

"No? Well, tell me this, Higgins. Have your people ever made a study of Pack people's traits, from generation to generation, to see if physical indications of regression are rising or falling at the same rate as the Novo senses?"

"I doubt it," said Higgins.

"Then how, in the name of the Sacred Gene or the objective knowledge you pretend to worship, can you tie the two things together? You've failed to make the kind of study that would provide real evidence for or against your belief that the Novo senses and the regressive signs have the same source! You have no use for the Novo senses, just like the ancient scientists. But you can't deny their existence like they did, so instead you put your evidence together in a way that says 'Novo senses are primitive, and no good!'

"What's more, you've overlooked something important about this connection you say exists between the genetic structures and the unconscious mind. The Pack people have been seeking stronger Novo senses for hundreds of years! Our unconscious minds must be as aware of that as they were of the fall of Science! Why don't you admit that this desire might be getting through to our chromosomes, Higgins? Is it because that would be admitting the Pack people are making progress in a very real way, and in a way you haven't touched with all your miraculous gadgetry?"

"Nonsense!" Higgins exploded. "Of all the absurd, self-justifying pieces of warped reasoning I've ever heard—"

"Don't get so red in the face, Higgins," Starn chided him icily. "After all, I was merely presenting a theory."

"Umpf!" grunted Higgins, obviously annoyed at himself over his loss of temper. He simmered down. "I'm sorry I blew up that way, Starn. As you say, you were merely presenting a theory—an extremely childish one, I must say, but . . ."

"Where's the flaw?" asked Starn.

"Let's see if I have this straight," said Higgins. "Your idea is that the fall of Science did have a regressive effect on the Pack people, but that this had nothing to do with the Novo senses, which received their stimulus later on, and from another source."

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"That's about it. Where's the flaw?"

"Well, I can't say right off. *But there has to be one there somewhere!* Something wrong in another way, though, is your motivation for producing such a theory. You have a deep emotional need for it to be true, Starn! The truth of a theory with such a motivation is necessarily suspect."

"And doesn't that apply to Olsapern theories that make Pack men degenerates?" demanded Starn.

"Absolutely not! We have no ill will toward the Pack people. Our trading posts, which we keep going solely to relieve hardships within the Packs, should make that clear."

"Solely for that reason?" Starn countered. "Don't you think helping the poor Pack savages gives you another reason to feel superior? Or that you might actually be trying to keep us inferior by making us dependent?"

Higgins grimaced angrily and strode off across the room to gaze out a window. Starn smiled. He had the Olsapern on the run.

"Don't ignore the lesson of this fight with Nagister Nornt, Higgins," he continued relentlessly. "Your science didn't stop him, and our Novo senses didn't stop him. He was beaten by the *combination* of the two, working together! We needed your talents and you needed ours! You can't keep pretending the Novo senses are worthless, and beneath the attention and understanding of your scientists, when you find them very worthwhile indeed when you're face to face with a dangerous enemy.

"And one final point, which my father made years ago: What about my own special sense, Higgins? I know you Olsaperns are fascinated and puzzled by it. Why? Because it is without precedent! You can't find a single slim thread of evidence tying it to ancestral man! That disturbs you, doesn't it? You're afraid it is something completely new, something leading directly toward the Ultimate Novo!"

He fell silent and eyed Higgins expectantly, waiting for the man to turn and face him. But when Higgins turned, the smile on his face was not one of gracious surrender. It was, startingly, a smile of triumph.

"Starn, lad," he chuckled, "how can you be so sure you're right about everything else when you're so totally wrong about *yourself!* A special Novo sense? Hell, boy! You have no such thing! What you have is a *creative mind,* and a fine one even if it is overloaded with nonsense! That 'special sense' is something you created, to meet a critical need of your boyhood, to make you the equal or better of your telepathic playmates!"

Starn shook his head. "It was nothing I did. It was just there."

"Not when you first needed it. Not until you were eight years old.

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You needed it before then. Novo senses don't wait that late to appear, do they?"

Starn frowned but didn't speak as Higgins continued, "We know quite a bit about the creative process, lad. It's our stock in trade, after all. One thing we know is that it isn't a conscious process entirely. The key activity is unconscious. Of course you have to be aware of a problem that urgently needs solving. Also, it helps to cast around consciously for an answer, or for data and ideas that might help supply one, but this is only to feed the unconscious mind, and to focus its attention. The creative solution doesn't come from reasoning and the use of logic. It suddenly just flashes up from the unconscious! Then all you have to do is make it work.

"In your case, you had to have a defense against telepaths, and your unconscious went to work on the problem. When you were fishing that day and needed the solution, the unconscious had finished its job and gave you the answer! Of course you couldn't understand that it was something you had created —that was part of the solution. You had to think it was a Novo sense, because nothing else would have made you normal and acceptable."

Higgins beamed at him. "Why do you think we've gone to such expenditure of effort and resources to grow you a new and genuine body, now that Nornt is disposed of? Out of sheer gratitude? Not that we're ungrateful for your valuable collaboration in a critical matter, but . . . well, gratitude isn't that strong a motivation.

"We did it because of the unique quality of your *mind,* your creative potential. We don't know of any mind ever displaying such flexibility, or such immediate or total rapport between conscious and unconscious as that 'special sense' of yours requires. Your wife has more than a touch of it, herself, and your son—well, we'll have to watch him and see. The point is, you've got the seeds of greatness in you, Starn!"

Feeling stunned, Starn slumped on the bed. He had found reason to reject many Olsapern theories, and those objections still held good whether Higgins accepted them or not. But so far as the nature of his own, highly-prized special sense was concerned, the Olsaperns were obviously and damnably right!

Novo senses did *not* wait until the age of eight to suddenly appear. And there were his strange dream experiences, while his new body was growing, in which hundreds of thoughts and clues had milled around, finally fitting themselves together into answers to the puzzling mysteries that had plagued him for so long—answers that came readily to conscious recall after he woke. The experience fitted Higgins' description of creative thinking with appalling accuracy.

"Then there is nothing special

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about me," Starn muttered. "No special sense."

"The only special sense anybody needs," Higgins beamed cheerily. "The infinity sense—the creative imagination. There's no limit to it."

Starn hardly heard him, because the world that had opened when he was eight years old had finally, irretrievably closed. He was no unique step toward the Ultimate Novo. He was, in fact, little more than what he looked like—an Olsapern with a silly imagination!

His failure to make Higgins see the value of the Novo senses was another blow. Because he had been wrong about one thing—himself—he had given Higgins the only excuse the man needed to conclude, quite comfortably, that he was wrong about everything else as well.

Why, if Higgins thought his mind was so uniquely gifted, was he so eager to discard its products?

Because, Starn realized. Higgins had a mind every bit as tightly closed as that of Starn's own father, back in Foser Compound preaching the gospel of the Sacred Gene and belaboring the sins of the Olsaperns! Higgins could give all the lip service he wished to "objectivity" and willing receptiveness of new data and theories, but on the subject of Novo senses his views were more firmly fixed than the stars in the sky. Reasoning and debating the question would never sway him, nor in all probability the majority of Olsaperns, by an inch!

And with that thought, Starn suddenly saw what he had to do. The infinity sense? That's what Higgins had called it, although creative imagination was not really a "sense" in a strict interpretation of the word. But if that was what Starn had, he might as well put it to work!

Higgins was talking: " . . . So why don't you dress and I'll send in your wife and son? Too bad we can't continue this discussion for hours, and clear up some of your faulty assumptions. But other duties are calling me."

"O.K.," said Starn distractedly, and began dressing as Higgins left.

His reunion with Cytherni and his introduction to his son was a moment of joy that briefly dispelled his doubts and gloom. But the decision he had reached a few moments earlier was going to affect the futures of his wife and child as well as himself. He had to talk it over with her, and hardly knew how to begin.

For a while Cytherni did not give him a chance. He had never seen her in such a talkative mood.

"And you should see the lovely house and things they've given us," she chattered rapidly, "with a garden and lots of forest and a sciencey kitchen you just wouldn't believe and a whole room full of books and a flier I've already learned to operate and I've taken up paint-sculpturing which is an art-form and a lot of people like my work and say it's imaginative and . . ."

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She saw that Starn was staring at her strangely, and came to an uneasy silence. She looked embarrassed.

"You have liked it here?" he asked.

"Oh, yes!"

Starn sighed. That eased him of part of his burden, at least.

"Cythie," he began, "it's been so long since we've talked that I'm afraid I'll sound like a stranger to you. I've thought about things we never thought about before. The Olsaperns aren't wrong about everything, Cythie. They've got a part of the truth. Their science has a reality. But in the Packs we have another part, and it is real and true, too, in its way.

"But . . . but the two parts have to be put together, Cythie! And nobody wants to! The Packs want nothing to do with Olsaperns and their science, and the Olsaperns refuse to study the Novo senses of the Packs. But if we ever hope to know the whole truth—and maybe if we ever expect to reach Ultimate Novo—they have to come together!

"The Olsaperns say I have an unusually strong creative imagination, Cythie . . ."

"Oh, you *have*, Starn," she replied earnestly.

"Well, it looks like that's about the only thing unusual I do have," he said, "so I'm going to use it. I'm going to stay here and try to become a scientist, Cythie! I'll never convince the Packs and Olsaperns that they have to get together by arguing with them. I'll have to *show* them! I'll have to prove the value of studying the Novo senses by doing it myself, and then producing results!

"So I can't go home, Cythie! There's too much to learn here that I can't learn in the Compound. And I already know things the Olsaperns couldn't let me take home in my head, so they would have to put me through hypnotic erasure to remove that knowledge, and I'd have to start from scratch when I came back.

"I'll have to spend my whole life with the Olsaperns, Cythie, because . . . well, because this is what I have to do. I hope you will stay too. This must sound strange and outlandish to you, but one thing about me hasn't changed. I still love you. Very much."

Suddenly she was in his arms sobbing happily. "Oh, Starn, you big oaf! I was so afraid you would insist on going back! And I don't think I could have, not with little William, or Billy, or Huill, or whatever you decide to call him! Did you think for a second that I could allow our son to suffer through the same kind of childhood we had, with those awful telepaths telling him what he could and couldn't think? I couldn't bear it!"

"You mean you would want to stay here, even if I didn't?" Starn asked, astonished.

"Yes. And don't worry about our

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people wondering what became of us. When the Olsaperns picked me up at Pile-Up Mountain, they took me to Foser Compound, and the telepaths read me. They know I killed Nornt and they think you're dead, because that's what I thought then. I had . . . gone crazy . . . so the people let the Olsaperns take me to cure me. That's all Higgins says the Pack people ought to ever know. We don't have to go back."

Starn held her close. Cytherni, the very best part of his old world now closed forever, was going to be with him in whatever new world was opening. And ahead was work to be done—a challenge of sweeping import that would have been incomprehensible to him in his earlier life.

The realization came abruptly that he had gained far more than he had lost. ■

in times to come

Jim Schmitz—who sort of specializes in unusual life forms—is with us again next month with "The Custodians."

This time, the odd life form is a Rilf—a decidedly alien being who, even with extensive surgical alteration, makes a rather weird looking "human" being. But a very efficient animated booby-trap indeed, with his natural, grown-in Weapon. Very neatly camouflaged—and very deadly.

While such a creature might not seem particularly adapted to symbiosis, he worked in just fine for one type of men—pirates.

As usual, Schmitz has come up with a fascinating new idea in lethal life forms—an easy winner over other life forms on his home planet, and quite naturally arrogant in his power. A type of attitude highly compatible with human pirates.

But you know—it's odd that none of the highest life forms on Earth have used either poison or massive armor in defending themselves against their enemies, or in attacking their prey. Only the very lowest of the mammals—the platypus—has poison glands; Man's defensive tactics seem hopelessly ineffectual, with his thin skin, small teeth, and useless claws.

Maybe that's what keeps him so alertly on guard against attack?

■ THE EDITOR

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It was almost impossible to live on Wraith—even for twenty-four hours. Because it made you live with yourself . . .

Illustrated by Kelly Freas

It was a lonesome planet circling a lonesome sun.

"Wraith," said Dr. Imray Garvin. "We'll land at the apex of that triangular continent, Captain Frizel. The center and more southerly of the three. Recorders on?"

"Yes, sir," said Frizel. *Old Stupid.*

Dr. Garvin turned to the assembled ship's company. "Ladies and gentlemen, when our second Moon expedition stumbled onto the Delphine records, changing us overnight from a planetbound to an interstellar culture, I was a young graduate student assigned to a study of the star maps. It is now twelve years since I first puzzled over the sector sheet in which we find ourselves."

Scholars a hundred years from now will reverently study this tape. Oh, sure they will, thought Frizel.

"The one-for-one correlation between Delphini thought patterns and our own was never more convincingly demonstrated than in this sheet, with particular reference to the planet Wraith. Beside it is a conventional sign: a stylized spaceship, barred. This indicates a proscribed area. No entry. No passageway. No parking, *chu-chu-chu,*" he chuckled.

"It's not all that close a correlation, not at all," said Fulton Ouelney querulously. "A viable society is structured in sex, government and religion, but the religious permeation of Delphini thought is without parallel on Earth. The so-called hollow man figurine is on every sheet of even the technical text—"

"The mirror man surely takes precedence," interrupted Trevorson. "He stands symbolically between two mirrors—"

Kassabian broke in, "But it's been established that the Delphini were the Cro-Magnons—"

Idonia Ryland Samand said, "The Indo-European language origin theory is substantiated—"

Dr. Garvin clapped his hands for attention. "Yes-yes. Quite so. Thank you. And this brings our attention to the translation of the Delphini name for this proscribed planet we

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call Wraith. Philologists, semanticists and our own Dr. Samand suggest Spirits-That-Walk, Paired-Audible-Laudible-Visual and *chu-chu-chu,* the Living-End as some of the approximations."

Old Doublestupid. Dust puffs out his ears when he chuckles.

As Dr. Garvin continued his remarks, Frizel studied the group in the control room with fresh wonder. Ouelney had lacy muttonchop whiskers and was a professor of cultural anthropology. Samand was a lean and dark woman with a gift of tongues; she had learned Basque to compare it with Welsh for pleasure and Frizel wondered in what language she dreamed. Elliston Trevorson was an historian standing six feet four, with a hollow chest and great fat white hands. The Valkyrie was Alison Kurland, M.D., an outsize woman so noble in appearance she should have been cast in bronze. Next to her was Fred Kassabian, a xenobiologist built like a bell pepper. And in the background was George Elwan Droff from the Department of Space, so packed with diplomatic expertise that Frizel had fallen into the habit of avoiding the deck where he stood.

". . . Captain Frizel will remain in static orbit above the landing point in what the military call *chu-chu-chu* a mobile reserve. Recording will be total. Now, if you please, everyone into protective garments. We meet in twenty minutes at the landing boat."

Lew Frizel slumped back in the pilot's chair and put his feet on the instrument console. Four screens gave a 360° view from the ship. The large repeater screen showed the lifeboat falling away. Seven of the little personnel monitor screens were alive with color, the eye in each helmet sending back pictures of the men and women in the landing craft. Frizel had tuned the voices down to a drone.

He closed his eyes and saw another picture: a caricature of himself, a small lugubrious man with a petulant whining mouth. *The fun-loving rover boy, Lew.* He slammed a door on this image, and under the door slid tendrils of a sickly green slime that converged and rose in a flood that covered his shoetops, ankles and knees. *Bile.* He instantly covered the sickly ocean with the argosies of his dreams, brave ships with silken sails, caravels with streaming pennons. *Glug, glug, glug,* they sank one by one. *Bitter bile.* Frizel's lips twitched. *There was something comical in the way those ships sank one by one in a military manner.*

An admiral once said, "Get that seagull-eating-offal grin off your face Frizel!" *Seagleadingawvul.*

"You are not a serious man," a woman told him, "but, oh Lew, you are such a beautiful man." He ran his hands over her rib cage. "Come here, Popsy. I am ready to show you how serious I am again."

A million laughs, Lew Frizel.

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So here he sat in the midst of marvels bewailing his fate, gnashing his teeth because he was not working in the stinking sweat of Earth technology, establishing a primitive miserable air bubble where men could live under the grit of a companion planet all of 238,000 miles from home. This was what he had trained for, this was the end toward which he had worked. He sympathized with the man trying to smuggle a bass fiddle out of a party at which he'd not been asked to play.

When the flabbergasted second Moon expedition had jettisoned every possible ounce of weight and returned to Earth with the total contents of the first compartment of the Delphine records, all aboriginal space experts became redundant. There were one hundred twenty-seven pounds of preliminary education in the first compartment, and the third Moon expedition opened Pandora's box with ease. Frizel, who had become an expert at hollowing out log canoes, was retrained to captain the battleship *Missouri*. Instead of joining a small band of heroes, he was converted to a cog in the advanced Delphine technology. Alone in the magnificent *University Explorer*, Frizel was irrationally disturbed that his cargo of specialists should be able to engage in happy academic revelry on a planet two hundred light-years from Earth; he was superstitiously distressed at walking in the shoes of a dead culture; he soberly mistrusted easy money, easy women and unearned packets of information.

Here you sit whango in the wonders of the sidereal universe and complain. Wake up, Mushhead. Maybe you'll learn something.

It was great advice he gave himself. He looked at the monitor screens and learned he had lost his mind. His feet slammed to the deck, he stood in a half crouch gripping the console edge. His eyes went from screen to screen and his mouth opened and shut.

The helmet eye was jiggling in an Ogallala Souix encampment on a brilliant summer day. Braves were watching negligently while the women of the camp cut switches and canes to suit their fancy. They formed two happy chattering lines. Hands came into view on the sides of the screen to tug muttonchop whiskers in wild exasperation.

The second screen looked up and up and up at the multiple levels of a ziggurat surrounded by scaffolding, the web of shadows black under the burning sun. The battered walls were being covered with brilliantly glazed brick by multitudinous ragged slaves.

There was black smoke and licking tongues of flame off over the templed hills. A man with a chaplet of laurel on his curled locks stood beside a Corinthian column and laughed. Then he turned mad glazed eyes from the fire and tucked an anachronistic violin under his chin.

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There was a terrace on the side of a valley so deep the bottom was lost in a lavender haze. The recording eye was fixed in paralysis on a man gesticulating with four impossible arms and hands.

Chandeliers, candlelit, reflected from the glossy parquetry and the bright eyes of bare-shouldered women. Franz Josef was on the throne. Violin bows rose and fell in a white shell alcove. The eye walked toward the Emperor. The women suddenly lifted fans and the men smiled and turned their heads away. The eye looked down to find black dress trousers on the floor around spindly ankles.

The next screen jerked and jounced. There was green grass between megalithic walls. The lens turned a corner to another corridor of stone, open to the sky and the hot sun. Run and turn to another narrow lane of scruffy grass, stumble and glance wildly behind, where in lumbering pursuit came a bison head on the body of a man.

The empty arching sky was cloudless. No birds flew. The grass-covered plain ran on and on in all directions, unbroken by trees or bushes. The helmet eye swooped down to the dry grass and raised again to show clutching fingers in the dry earth, as if the man feared he would fall off in the turning of a flat world.

Frizel slapped the big repeater screen to the landing craft turret. The lens was idling through its circle and showed a pleasantly rolling section of Wraith, wooded in the hollows that ran to the sea. As the eye swung north, men and women appeared. They paid no attention to each other. A man in a red protective suit was running wildly and staggering as he ran—Ouelney lashed by the Ogallala women? A figure in discrete gray was holding its waist desperately—Droff at the court of the Double Eagle. The tall woman in light green, turning sharp corners in the empty field was Kurland running in the maze. The man in orange clutching the grass was Dr. Imray Garvin all alone on the steppes. The other figures in yellow, hot pink and blue were standing still in the middle of their own perplexities.

Away off in the distance Frizel heard the first bars of "The Halls of Montezuma" and impatiently dismissed damn foolishness from his mind. Rushing to the rescue like a company of U.S. Marines into this swamp would not bring representatives of Smart Pill manufacturers flocking around him for testimonials while he sank into the quicksand.

He reseated himself at the console and made sure the control room recorder was on. He gave a précis of what he saw in the personnel screens. He attempted to speak with the people on the planet below. They paid no attention. Samand, the linguist, was babbling—or Babeling—in unknown tongues. Kassabian, the xenobiologist was still

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frozen in disbelief and a glance at the screen showed that the four armed man had been joined by a creature with eight legs, no body to speak of, and the head of a gull elk. Kurland was still running in her Cretan labyrinth and Trevorson was listening to the "Flight of the Bumblebee" while Rome burned.

Frizel worked for an hour with speed and precision. He recalled the landing craft and heard it clunk into the cradle. He programmed the ship to return to an Earth orbit if the order was not countermanded within twenty-four hours. He reported his proposed plan of action. He ordered a maximum suit up from storage prepared with all protective gear. He ignored a picture of himself as a troop of cavalry with guidons snapping and bugle bleating. He drank a can of soup.

He climbed into the suit, which was roughly comparable to climbing into a fitted bank vault, wriggled aboard the landing craft and plugged into the remote controls. The *University Explorer* dropped away above him. On the way down to Wraith he thought about how nice it would be to have a specimen ship. In the comfort and convenience of your own living room, you sent down a boat to snaffle whatever you wanted. He had seen plans for such a Delphine ship, but none had been built. In lieu of such future conveniences he had cut a roll of flexible cable into three-foot lengths.

"What are you waiting for?" he asked himself after he had landed. *So I can run like hell if I get a good excuse.* He sighed and climbed out of the lifeboat. *Here I come in my Hero suit, ready or not.*

The nearest person was Garvin in orange, desperately alone on the endless grassy plains. When Frizel hoisted him up, he walked somnambulistically back to the landing craft. Frizel tied him to a seat when he could get no meaningful conversation from him. Kassabian and Droff gave no trouble, but Ouelney and Samand had to be dragged to the ship. When he went to get Trevorson, he was attacked by a black knight in full armor mounted on a great black plowhorse—somewhat out of phase. Frizel could see the bushes through him from time to time. When the knight was steadily in view, his lance was extremely skewersome.

Frizel was not armed. He turned up the gain of the loudhooter and yelled. This spooked the horse and nearly unseated the rider. Trevorson came willingly enough and Frizel tied him to a seat. Then he watched the knight prance back and forth outside the ship. Kurland was not in sight.

Six out of seven is pretty good. Maybe his bundle of trussed specialists would have some brilliant thoughts if he took them back to the ship. The black horseman impressed him. The horse was lathered with sweat and the dust rose thick when

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the great hooves thundered by. His passengers showed no signs of recovery. It would not help them and it would do him no good at all if he got skewered by the knight. Frizel felt like a target on which a battalion of artillery has fired short and long.

Back at the *University Explorer* he found his experts were as obsessed as they had been on the planet. He checked the personnel monitor screens. Ouelney was still sticking his foot into his mouth, but this time with a bunch of chocolatey people on a white beach. There were palm trees in the full color background with an iron pot, giant economy size, bubbling over a fire. Samand was trying to read directions printed on the heel of a boot, and they were unintelligible to her. Trevorson was wringing his fat hands on an airship with wings like a June bug; a crowd of priests wearing sweatshirts with "Lemuria U" emblazoned on them were leaning over the rail, watching great temples topple into the surging ocean. Kassabian was surrounded by a zoo of impossibilities sneeering at him. Droff was trotting down Embassy Row, wheezing and puffing, trying to gather up papers marked Super Top Secret which the wind blew ahead of him. Garvin was at a cocktail party with laryngitis and everyone there had views opposed to his own.

Acting on inspiration, Frizel took hold of the nearest man, Kassabian, and shook him. The screen still showed him on the side of the improbable gulf engaged in conversation with a jellyfish. The pattern was not jarred by physical force; there was no kaleidoscope effect.

Frizel tied them all to their beds and went down to the planet again with the utmost reluctance. Kurland was still getting her exercise in the labyrinth and Frizel was stuck with the principle that you brought everybody home, gibbering idiots or not.

His acquaintance in the black tin suit was elsewhere, but when Frizel stepped out of the boat, he found himself as suitless as a baby mouse in a cylinder of stone fifty feet deep and half that in diameter, the cynosure of interest for a herd of slugs up and down the walls and over the floor. The creatures averaged four feet in length and this afforded Frizel an excellent view of their eating mechanisms. He shuddered. He kicked the nearest in the slimey side, broke through the membrane and had a foot covered with a revolting ichor.

Bubble, bubble, toil and trouble. This planet was unlikely as hell and as familiar. He stood stock still and concentrated. A great saltshaker wavered into solid existence over the pit and grains of salt as big as dice began to pelt down.

Immediately he was in his suit again, walking over the crest of a gently rolling hill. Kurland was on

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a side slope, wearily jogging along. As he approached her, he was attacked by a band of cowboys with bows and arrows.

Indians, Indians, Indians! He nodded as the cowboys turned red. *Play arrows,* he ordered hastily, and sighed as he removed an arrow with a suction cup from his helmet. *All right, that was very nice. Back to your wigwams.* They whooped and rode off in a cloud of dust.

A somewhat tentative covey of dragons appeared in the sky and Frizel sent a flock of turkey-size kingbirds after them.

He caught Kurland, tied her hands and feet, threw her over his shoulder and carried her back to the landing craft. A great chasm appeared in the ground and yawned at him. He spanned it quickly with a handsome cantilever bridge and walked across. They were in the landing boat when a laggard bolt of lightning hit the bridge and tumbled it into the gulf.

Back at the ship again, Frizel tied Kurland to her bunk and ate another can of soup. He was a weary man. Kurland outweighed him by at least ten pounds and he had already put in an active day before he hauled her a quarter mile to the landing craft. He sat in the pilot's chair with a cup of coffee, feet up on the console. He closed his eyes.

Maybe the Delphini knew what they were doing when they proscribed Wraith. There was no question that they were men and that they had landed on Earth fifty thousand plus-or-minus years ago. The argument was over why they had done this. Why would any people abandon an interstellar culture? It was a prime spare time argument for the experts.

Samand said, "Because they needed the refreshment of going back to Earth. Any earth. They had hoisted themselves as Hercules strangled Antaeus in the air. Human beings need contact with Earth as much as they need oxygen."

"But they were an ultrasocial culture," said Garvin. "Gregariousness was as essential to them as occasional solitude is to us. We had to modify the plans of the *Explorer* to make individual rooms instead of a dormitory—the Delphini were a hive people."

"There was no choice," said Kassabian. "A ship or two got caught in a natural catastrophe on Earth. They were stuck and made the best of it."

Trevorson asked, "If this is so, why the repository on the Moon? All evidence indicates the Delphini knew what they were doing."

Ouelney said, "The home planet is indicated on none of the star charts. The Moon deposit could be a bluff for any other space race, openly illustrating their space technology—their very earliest space technology."

Stop dreaming, Frizel. What do you do now?

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"Well, ladies and gentlemen, on the basis of in situ evidence," said Frizel pompously, "I think the Delphini were scared out of space."

A brilliant deduction. Much applause. Very helpful.

"Ho-ho!" he said as an idea swam into his mind. He activated the master recorder, picture and sound, and made a random selection. There was Kassabian again, listening to the man with four arms. He had a bitter screeching voice. The trees were like asparagus ferns and the berries were the size of watermelons. The valley below was enormously deep. There was a lavender haze and from the very bottom of the gulf was the sun's reflection from a river. Light reflected? Mirror. The mirror man.

And how does this affect the price of lima beans in Manchuria?

Frizel turned off the recorder. No one has ever developed a yardstick for measuring objective reality. There was no easy way out of this maze. If some entity on the planet Wraith was manipulating minds, it was just as easy to delude Frizel with apparent recordings as it was to confront Kassabian with a gabby jellyfish or a four-armed man. Frizel stood up suddenly. He sat down slowly. It was just as easy to have Ouelney slashed by the whips of the Ogallala women and have the wounds crusted with dried blood.

A giant brain?

A gaseous intelligence a cubic mile big?

A linked telepathic entity composed of every living creature on the planet?

"Why not forget all this and go home?" Frizel asked himself with a surge of hope.

It could be a disease. You were all buttoned up, but your kookies wore light suits and respirators.

"Then why not make a jump and see what happens?" asked Frizel, astonished at his brilliance. He swung to the computer and programmed a light-year jump away from Earth. He complimented himself on this devious sagacity. If the Giant Brain extrapolated his line of flight, it would end up somewhere else, and Frizel could easily harden his heart to the plight of some hypothetical life form driven nutty by Wraith. When the board was green—the Delphini had used orange and purple—he shoved the execute toggle.

Twenty-two ship hours later the *Explorer* was back in static orbit off Wraith. Frizel had eaten and slept and he had plotted out a play. He called it the Filbert Orchard, because his nut farm was just as squirrelly as ever. Distance made no difference.

He fed and watered his charges. They were on their beds engaged in personal misadventures: Ouelney was still making an ass of himself as a cultural anthropologist; Samand was in a group of mentally retarded children who commanded the language better than she; Trevorson

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the historian was at the coronation of Lord Greystoke as ruler of England; Kassabian was watching a cell divide into three dissimilar parts; Droff could not control his flatulence at a dinner party with the President; Kurland was resisting the advances of a sex-mad swan; and Dr. Imray Garvin was trying to organize a game of marbles among his peer group and no one would play with him.

"This is a nice orbit," Frizel suggested. "Why not build a nice fire in the fireplace, put on my nice warm slippers and curl up with a good book? After a while somebody'll come along and tell me what to do."

And you could be dingbat superintendent for the rest of your life.

"Heigh-ho. With just a little extra effort, I could have been a garbage man," he grumbled as he climbed into his bank vault, "but no, I had to fritter away my time with astrogation and fancy doodadery like the whichness of wavicles interphase bent. I could have gone straight and had a happy tract house and a happy tract wife and happy tract children." He looked around the spaceship in mournful farewell. "Get on your stick, old buddy. Fine words butter no parsnips and moonlight mends no mittens."

Into the landing craft he went, checking off his little lists: the *Explorer* was programmed back to an Earth orbit in twenty-four hours and all set to holler "Mayday" when it got there. The experts were tied to their bunks with bow knots. They could easily free themselves if they somehow achieved undinglement. If not, they would die in their bunks. And the kindly old sleighman, Lew Frizel, was leaping into the snow to have a group discussion with the wolves.

"Third time's the charm," said Frizel as the landing craft touched ground. *Here I go into a mental duel with a Giant Brain.* He grinned. "All unarmed."

This time, with a queasy sickening lurch, he was involved.

He was twelve years old. It was early fall and a Saturday morning. In another hour the gang would gather for a grudge football game. That afternoon his father would take him to the Nebraska-Kansas State game in Lincoln. He was full of the juice of life. He walked to the playground in the park with the intention of chinning himself ten times on the horizontal bar, really putting his chin over the bar, no cheating, and making it look easy.

Leaning against a tree was a rackety kid Lew had never seen before. A cigarette was hanging in the corner of his mouth. He had a hollow chest, arms like pipestems, an unhealthy complexion and a nasty hacking cough. Lew ignored him and did his ten chinups without puffing hardly at all. The rackety kid spat out the cigarette butt, coughed, grinned an evil grin and chinned himself five times with one hand. He dropped to the ground,

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coughed again, and chinned himself five times with the other hand.

Lew played well in the football game that morning and the Kansas State game was an exciting squeaker and Nebraska won. But when he went to bed that night he no longer believed in athletics, and from this proven premise, he began to doubt many other things.

Snap.

Frizel was deathly sick, clinging to one side of the hollow ball of space. He shouted and his voice reverberated faintly from clouds of ominous stars. A bunch of concord grapes with undisturbed bloom hung near him, larger than worlds, and giant fingers squeezed him like a grape.

Snap.

He was in Japan on the bank of a canal. His father was in the Air Force. The children had all gone home from his sixth birthday party. He had received many fine gifts from his friends. He was full of cake and lemonade. He stood on the canal bank behind the house in the sunset glow.

Snap.

Frizel was King of the World. He had wives and gold and wars, and was blessed with an insatiable appetite for all these things. Fate seized him by the neck and sliced him into a thousand wafer-thin shadows and threw him into space. For a thousand years he froze and bled and each planet a shadow touched was corrupted by Lew Frizel.

Snap.

He was in Vietnam asleep in a slit trench when Charlie dropped in on him. It was a dead black night and he had very carefully arranged his stolen sheet of six mil plastic so that he was dry. Charlie stabbed him just above the knee having been a little less than careful about his orientation, and stabbed again, ripping the plastic. Frizel was outraged. He didn't mind the attack. That was reasonable. It was the loss of the plastic sheet as they scrambled in the trench. Frizel held Charlie's face in the slurried blood and mud and water until the body stopped twitching. Then he called for an aid man, still trembling with fury at the ripped plastic sheet.

Snap.

He was embedded in amber and could not turn his head or close his eyes as a parade of Lew Frizels trooped before him. Cheating Frizel with crib notes up his sleeve while better men made honest scores. Brave Frizel, who puked in the bushes after shoving a dumb kid out of the way of a careening car. Idiot, hurtful Frizel saying, "Hey Margie, your eyes are too close together." Envious Frizel, using smart careless words about a friend to impress a fool. Successful Frizel, being

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congratulated by his boss for work half inspiration, half stolen. Prideful Frizel, who ignored how many peanut-butter sandwich lunches made a tailored suit. Humble Frizel, who groveled to placate an idiot.

Snap.

Frizel saw mankind mirrored in himself and his soul turned sick. He was overrun by a stampede of all the creatures of the dark. He struggled frantically in the black net of common experience. He was trapped in the common horror of a frangible creature who can judge himself.

He was falling and he screamed as he fell.

He was alone and paralyzed with fear.

He was a man among a billion other maggots with inbuilt circuits of madness and irrationality. He was the ungainly issue of the mating of ape and angel, a crippled blending of the incompatibles, emotion and reason.

Frizel had known black nights before, but never this absolute loathing for every mirrored figure of himself endlessly repeated in scenes of casual brutality. Rape, murder and cringing abasement were integral in him, and worse, with his obedient rational mind he clothed these things in morality, principle and worship.

He was the very mirror of man and with all the gauds and jewelry, the music and the poetry, the proper crown of man was death. In the formula of man, exoneration was balanced only by extirpation. So he would die.

Surrounded by the drooling lunacy of himself and his genus, from some deeply hidden source came a calm question, "Why not wait a bit?" All the creatures of the night raged and hooted. Should a walking shambles of corruption like Lew Frizel continue to live?

"What the hell," piped the placid little voice, "however enticing an either-or, man is made for temporizing."

All the creatures of the night, the slavering beasts, the cringing worms, the stupid lambs, the faceted man infinitely repeated in the mirror maze, all of them hushed and waited.

Lew Frizel stretched his arms. He scooped in the sad mad bad creatures of the night and they were again a part of himself. He was no longer the hollow man. He yawned and stretched again in the loneliness of the universe, complete in himself. He slept.

He woke in the meadow by the landing craft with the morning sun in his eyes. His body ached as if he had indeed been wrestling demons, but his mind was clear, brightly burnished and at ease. He took off his suit and left it in the lifeboat. He walked for half an hour in the sun, watching a city grow on a peninsula that thrust into the blue

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sea. Brave ships with silken sails and caravels with streaming pennons were sailing to the port. He let them sail. Without even a sigh, he turned his back on a sort of promised land—he knew there was breakfast on a sunlit table waiting for him in the city—and walked to the lifeboat.

As soon as he was aboard the *University Explorer*, his distinguished passengers were themselves again. "I couldn't tell how long this remission would last, Dr. Garvin," Frizel lied cheerfully, "so we're in null space programmed back to Earth."

"Thank God!" said Garvin.

"If you want to investigate further, we can turn back."

"Walk into that bear trap again? No, sir!"

Frizel honestly admired the scholarly approach with which his passengers attacked their problem. There was considerable initial embarrassment which they all managed to overcome, except for Droff. He sat in a corner staring into the middle distance wrapped in a thick haze of diplomacy: see nothing, hear nothing, do nothing. After a while he began to weep and Kurland plugged him full of sedatives and put him to bed. Frizel decided that his imaginary dinner party with the President had totally unnerved him.

It was evident from the tapes that Frizel alone had remained an objective observer, and further that he was privy to the private adventures of each individual which did not appear on the tapes. Interphase travel is the dullest mode of transportation known to man, directly comparable to climbing into a hole and pulling the hole in after you, and since the trip would take about twelve ship weeks, there was ample time for discussion.

"Wraith is a hallucinatory planet and we don't know why," said Dr. Garvin. "Captain Frizel was partially immune, but for the rest of us, we might as well call it *chu-chu-chu* the LSD planet." Frizel did not suggest that Wraith might be an amplifier of the entire mental spectrum.

"We were all hit on a subjective level, a planetary denial of the Fifth Amendment," said Trevorson resignedly. "What protection can there be?" Frizel did not answer that man's only enemy always has been himself and that if protection consisted of anything but running like hell, it was an interior thing.

Ouelney pointed out that twelve and one half percent of the personnel was only moderately affected by Wraith and why could not Captain Frizel return with other scientists for further investigation? Ouelney himself had commitments for the next three years, but he would back the idea with every resource at his disposal. Frizel smiled, but did not reply that he felt no pressing need to return.

"It is a truism that language is

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the culture," said Idonia Ryland Samand, "and the Delphine language offers endless speculation to philologists. It is as devoid of emotion as Fortran or Cobol. I have been wondering what happens to a truly rational people exposed to Wraith—perhaps even an instinctual culture—"

"The Ant Men flee to Earth?" said Kassabian. "What a nasty aberration to their people! A poker game with all cards wild and a wilder hole card on the Moon." He went on to speak in wearisome detail of the mutually antagonistic life forms on Earth and the simpler patterns found on other planets since the Delphine cache was found.

Alison Kurland said very little, but one night she caught Lew Frizel alone in the control room with his feet up on the console, monitoring the sensors as they rotated in and out of the null condition. "And what do you think, Captain Frizel?"

"I think a batch of the Delphini had extraordinary courage to hazard life on Earth with the long-range expectation of an unforeseeable regeneration. They planted the Moon cache, so if resurgent they would not forget themselves."

She was oddly ill at ease. "Do you know your eyes are not so cold a gray? I am a psychologist as well as a physician.Wraith seems to be a case of physician heal thyself. Lew, what do you think of Wraith?"

"It's like jumping into an ocean to see if you can swim."

She smiled. "Aren't swimming lessons possible?"

"Oh, sure. We've been paddling for fifty thousand years."

"Lew Frizel, I think you know more than you're saying."

He looked at her with that peculiarly integrated expression she had noted since Wraith, as if he lived at ease with joy and sorrow, love and lust, sun and rain.

"Oh hell, any fool has answers," said Frizel, "but I think, because of a preposterous gamble fifty thousand years ago, we are now in a position where we can begin to ask some pertinent questions."

"Le coeur a ses raisons que la raison connait tout?" she asked, paraphrasing Pascal.

"The universe is big and dangerous," said Lew Frizel, forgetting her presence, "but I think . . . I believe we are beginning to be a formidable people." ■

THE ANALYTICAL LABORATORY / AUGUST 1968

PLACE	TITLE	AUTHOR	POINTS
1.	Satan's World (Conc.)	*Poul Anderson*	1.50
2.	The Baalim Problem	*Bruce Daniels*	3.00
3.	Appointment on Prila	*Bob Shaw*	3.02
4.	Specialty	*Joe Poyer*	3.25
5.	The Fuglemen of Recall	*Jack Wodhams*	4.20

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The shots felt 'round the world

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BY EDWARD C. WALTERSCHEID

Since we are in the very early beginnings of the atomic-powered era, almost any atomic experiment has both great military, and great peaceful-industrial meaning. An atomic explosion—like a chemical explosion—is neither bane nor blessing; it is simply a fact which raises major problems in trying to do industrial atomic research!

The forerunners of nuclear weapons are things known euphemistically as nuclear devices. A nuclear device is merely a nuclear explosive whose designers hope will meet certain requirements as to yield, effects, type of energy output, et cetera. To develop a nuclear device into a full-fledged nuclear weapon can take a lot of testing. Just how much testing is required is not something that the nuclear powers are willing to comment on. In fact, it is well-nigh impossible to ascertain just how many nuclear tests occur in any given year, much less to determine which tests are related to what project or system.

In 1963 the partial nuclear test ban treaty was hailed as a significant first step toward controlling, curtailing, and perhaps even completely banning nuclear tests. The vast majority of the nation-states of the world were more than willing to drive nuclear testing underground in the hope that this would somehow limit it.

Their hope has not been fulfilled. France and China have opted to continue atmospheric testing, while the United States and Russia

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elected to go underground, but not to stop. The result is that today nuclear testing goes steadily—if not merrily—on.

The U.S. Atomic Energy Commission (AEC) is the most authoritative source of information concerning nuclear testing around the world. It periodically releases information on nuclear tests by the United States, Russia, Great Britain, France, and China, which are at present the only known nuclear powers.

However, the AEC does not announce all tests by either the U.S. or Russia. Several reasons are advanced for this selectivity. First, notice of certain U.S. tests would —or possibly could—provide useful information to Russia with regard to both detection and the nature of the tests. Secondly, all Russian tests are not announced because to do so would give a considerable indication of the U.S. ability to detect nuclear detonations. Another reason why all Russian tests are not reported may be that the smaller ones simply may not be detectable by present methods.

Through December 31, 1967, the AEC had disclosed at least six hundred eleven nuclear tests conducted during the last twenty-two years. Although there is no precise way in which the number of unannounced tests can be ascertained —it may be that even the AEC does not know the exact number of Russian tests—a rough approximation suggests that by the end of 1967 somewhere around six hundred fifty nuclear tests had occurred. These tests had a total yield of about 525 megatons, with individual yields ranging from a few hundred pounds to the 58-megaton monster detonated by the Soviets in 1961. (A megaton of yield is equivalent to the detonation of one million tons of TNT.) Figures on yields are approximate because: 1. yields of the higher-energy tests are difficult to accurately calculate; 2. often although a test is announced, its actual yield is not; and 3. some tests are not announced.

The total yield of these tests was derived in the following fashion. The AEC provided data which indicated that the combined total yield of British and American tests through 1962 was about 161 megatons. The Russian total yield through 1962 was given as about 350 megatons. Since 1962 the AEC has announced very few actual yields from either U.S. or Russian tests. Instead yields are given as low, low-intermediate, intermediate, and low megaton. Low yield means less than 20 kilotons; low-intermediate means 20 to 200 kilotons; intermediate means 200 kilotons to 1 megaton. Low megaton

This crater at the Nevada Test Site was formed by the 100 kiloton Sedar test. It averages over 1,200 feet in diameter and is 320 deep.

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means 1 or 2 megatons. On the basis of yields given in this fashion it was estimated that the U.S. tests from 1963 through December 31, 1967, had a total yield of about 6 megatons.*

Russian tests apparently have not been as plentiful as U.S. tests in the last few years; however, they tend to have somewhat higher yields. Consequently, Russian tests for the same period were estimated to have a total yield of 5 megatons. All French tests to date have yielded less than 0.5 megaton while Chinese tests so far seem to have a total yield of about 2.5 megatons. Adding all these figures gives a total yield of about 525 megatons.

Nuclear tests are indeed the shots felt 'round the world. Every time a nuclear power tests a nuclear device, a reverberation is caused—both literally and figuratively—within the other powers. What was the purpose of the test? Where was it? What does it signify?

Craters at the Nevada test site beautifully demonstrate the relative power of high explosives such as TNT and thermonuclear detonations. The actual size and mass of the "Sedan" thermonuclear device is not available for publication; it was rated at "medium range"—100 kilotons equivalent. The other craters were: A. 40,000 pounds H.E each. B. 1,000,000 pounds (0.5 KT) HE. C & D. 1.2 KT of H.E. at different depths.

Almost of necessity, any discussion of nuclear testing must be concerned primarily with the United States. The U.S. was the first nation to test a nuclear device and has since conducted more than twice as many tests as all other nuclear powers combined. Because of their close relationship to weapons development, U.S. nuclear tests are not often discussed in much detail in the open literature. Yet, surprisingly enough, a considerable amount of information concerning them is available.

By 1967 four hundred twenty-seven U.S. nuclear tests had been announced. This should not be taken as the total of all U.S. tests since numerous tests at the Nevada Test Site (NTS) are not made known to the public. It is difficult to say just how many undisclosed tests have occurred, for those who know aren't talking. However, at a press conference on August 23, 1963, President Kennedy mentioned twenty-three tests that had occurred at NTS since September 15, 1961, but that had not been previously announced. Extrapolating from this is admittedly a risky business, but it is probably safe to say that this country has now conducted around four hundred fifty nuclear tests.

The four hundred twenty-seven announced U.S. nuclear blasts include three hundred ninety-eight

*This estimate is probably already on the conservative side. In January a test at the Nevada Test Site was estimated to have a yield of about 1 megaton.

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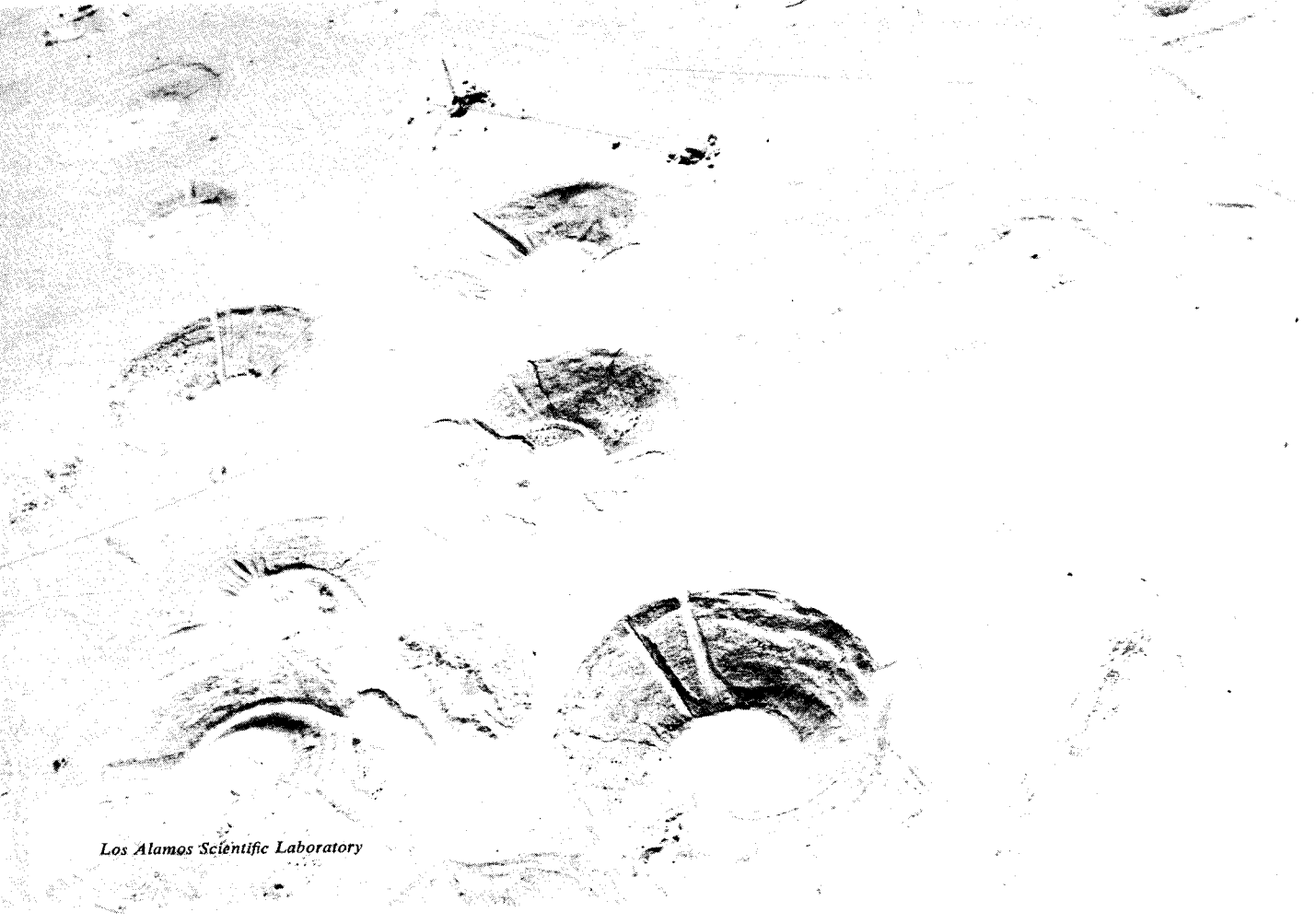

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weapons tests, two WWII bombings, nineteen Plowshare experiments, four experiments conducted for Great Britain, and four Vela Uniform experiments.* Three hundred and seventeen of these detonations have been at NTS; one hundred and three outside the continental United States (ninety-eight in the Pacific, three in the Atlantic, and two in Japan); one each at Alamogordo, New Mexico; Carlsbad, New Mexico; Fallon, Nevada; and Amchitka, Alaska; and two at Hattiesburg, Mississippi.

Weapons tests can be divided into three broad categories: development, effects, and vulnerability experiments. As the name implies, development tests are concerned with the development of new and improved nuclear weapons. Although the reasons for which particular weapons are developed have varied through the years, one endeavor continues to be apparent. That is the effort to increase the yield-to-weight ratio of the amount of yield produced by a weapon of a given weight. Periodically, weapons are also removed from the stockpile and tested to ensure that they meet precise design specifications.

Recently, emphasis has been placed on developing enhanced radiation weapons—neutron bombs. Such devices would be very "clean." A "clean" bomb or warhead is one which produces relatively little fallout or other debris which would spread radioactive contamination unpredictably over large areas. In a "clean" device, only a small amount of the energy released would come from fission. The blast effect would be very small and the radiation effect from neutrons would be predominant. Research is also being conducted on pure fusion weapons which would require no fission triggers to set them off. The status of programs for developing such weapons is classified.

Subsidence craters formed by underground nuclear tests at the Nevada Test Site. Drill rig marks site where another detonation somewhere around 1,000 feet underground will occur. The circle around the rig indicates expected size of subsidence crater.

A great deal of U.S. testing has been devoted to determining the effects of nuclear detonations on both military and civil targets. Nuclear detonations are similar to conventional explosives in that their destructiveness is due mainly to blast or shock; but this is about the only similarity. For one thing, nuclear explosions can be fantastically more powerful than the largest high-explosive detonations.

Secondly, much of the energy in a nuclear explosion is released as light and heat. This thermal radiation can cause bad burns and start

*Vela Uniform is a U.S. program to develop techniques for detecting nuclear detonations.

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fires at considerable distances from the explosion.

Finally, at the instant of detonation, nuclear explosives release highly penetrating and harmful radiation. The products of the explosion are radioactive, emitting similar radiations over an extended period of time.

Calculating or determining experimentally the effects of nuclear detonations is a complex business. In the first place, there are inherent difficulties in making exact measurements of weapons effects since the results are often dependent on circumstances which are difficult, if not impossible, to control, even in a test. Furthermore, two nuclear devices with the same yield may produce markedly different effects because of differences in composition and design.

In recent years, one particular form of effects testing has received special emphasis. It concerns the vulnerability of weapons systems to nuclear detonations.

Significant and evident measures, e.g., silos and underground installations protected by massive shock absorbers, have been taken to protect these systems from possible blast and shock effects. A more difficult problem, though, is protecting a particular system from the electromagnetic pulse produced by a nuclear detonation. This electromagnetic pulse—or EMP as it is more commonly called—may have adverse effects on electronic components in launch and control facilities or the rocket vehicle itself —assuming a weapons system such as, for example, the Minuteman ICBM. It can also cause shock heating in the heat shield of a reentry vehicle or nuclear components of the payload. Various other ill effects are also possible; however, neither the AEC nor the Department of Defense will comment on them.

Numerous experiments have been conducted at NTS to determine 1. the effects of EMP on current weapons systems, and 2. means of protecting these systems against adverse effects. A corollary to this effort is the development of specialized nuclear devices which will emphasize certain types of EMP. It is probable that any successful antimissile defense would rely on warheads employing EMP to destroy incoming enemy warheads. Since some components of the enemy warheads are undoubtedly more vulnerable to certain forms of EMP than to others, it seems logical to assume that nuclear antimissile devices are designed to produce intense burst of certain types of EMP. Precisely what these might be neither the U.S. nor Russia is saying.

Two candidates, however, immediately come to mind. These are high-energy X rays and neutrons. Recent public pronouncements have indicated that the U.S. has de-

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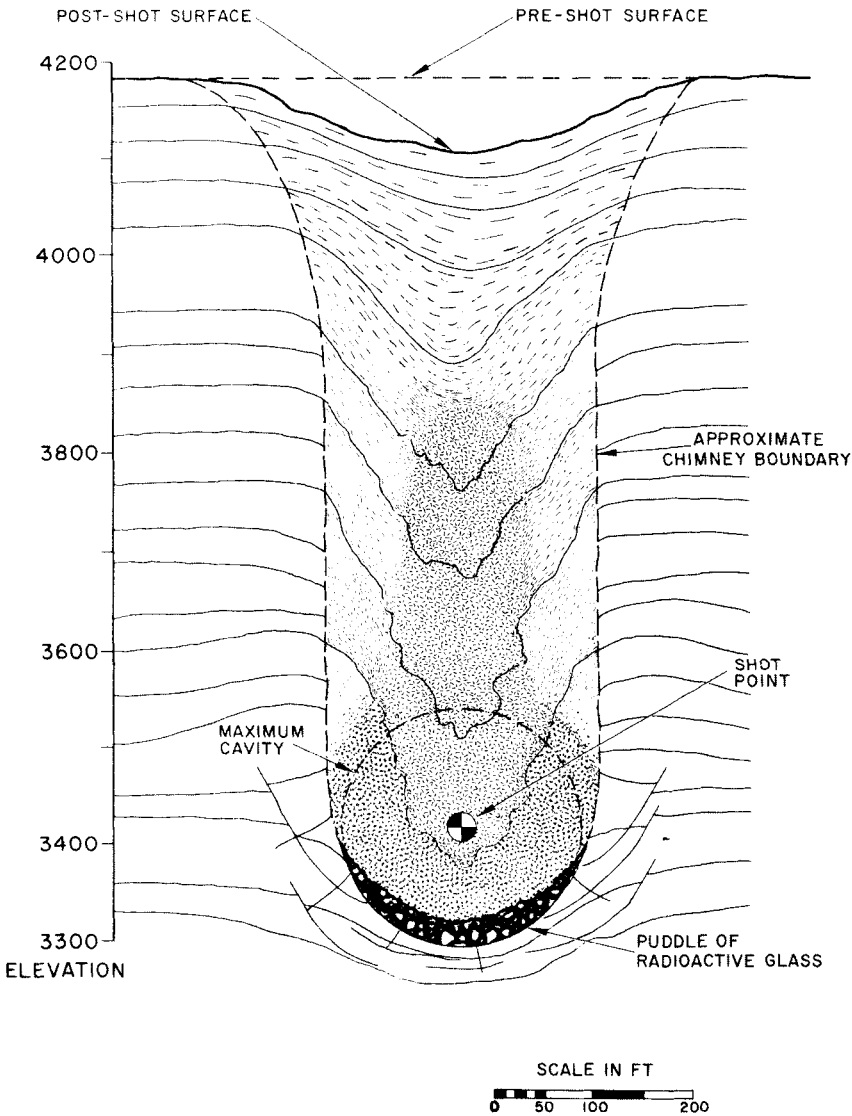

Cross-sectional representation of the aftermath of a typical underground nuclear test at the Nevada Test Site.

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veloped an antimissile nuclear warhead, believed to have a yield in the 1-megaton range, which when detonated releases nearly eighty percent of its energy in the form of high-energy X rays.

What happens to an incoming warhead struck by such X rays? It depends on the yield of the nuclear detonation producing the X rays, the size of the re-entry vehicle, and the distance the incoming warhead is from the point of detonation. If the warhead is within the so-called kill radius, some of the following are likely to occur:

On striking the heat shield of the re-entry vehicle the X rays give up a small portion of their energy to ionize a thin layer of the shield. This may so damage the shield as to cause the warhead to burn up on re-entry. Much of the remainder of the energy of the X rays is transformed into a shockwave which rapidly passes through the warhead. This shockwave may detonate some of the conventional explosive within the warhead or it may damage electrical components. It may also distort critical shapes within the nuclear device so as to either cause it to malfunction or greatly reduce its effective yield.

In addition to X rays, the nuclear detonation will produce great quantities of neutrons. Depending on their energies, these neutrons can cause fissions in fissile material—plutonium, uranium 235, and uranium 238*—within the incoming warhead. These fissions in turn produce heat which can also distort critical shapes or set off conventional explosives. In sufficient quantity, these neutrons might even cause the nuclear warhead to prematurely detonate.

Although both high-energy X rays and neutrons can be shielded against to some extent, such shielding will increase the size and complexity of the re-entry vehicle.

EMP is rather quickly attenuated in atmosphere, e.g., high-energy X rays are rapidly absorbed in air. Though no such difficulty occurs in the hard vacuum of space, even there the effects of EMP diminish rapidly. Thus an incoming warhead two miles from the nuclear detonation will receive only one-quarter of the X-ray energy that hits a missile one mile away. At a distance of three miles, the impacting X-ray energy will be only one-ninth as large.

Although it is impossible to say for certain, there are broad indications that Russian nuclear weapons development has roughly paralleled that of the United States. The United States, through the AEC usually, has announced one hundred twenty-eight Russian nuclear tests. In addition, since the beginning of 1964, the United States

*U-235 and U-238 are quite different in their nuclear behavior. Only the very fast—extremely energetic—neutrons cause U-238 to fission, whereas U-235 is fissionable by neutrons of all speeds. U-238 has a tendency to decelerate neutrons and then capture them without fissioning.

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has announced recording on fourteen separate occasions seismic signals which originated from Soviet nuclear test areas. The clear implication of these announcements is that the seismic signals were caused by nuclear tests. Consequently, through December 31, 1967, presumably at least one hundred forty-two Russian nuclear tests had occurred.

Russia has conducted some extremely high-yield tests. Although guesses as to the yields of some of these tests have ranged up to 100 megatons, the highest yield reported by the AEC is 58 megatons for a test announced October 30, 1961, as having occurred at Novaya Zemlya in the Soviet Union. At least three other tests are announced as having yields of 20 megatons or more.

By comparison, the United States does not admit to having tested any nuclear device with a yield in excess of 20 megatons. This would seem to indicate that the Soviet Union has an edge in the development of very-high-yield devices.

Since the signing of the partial nuclear test ban treaty, the great majority of Russian nuclear tests have occurred in the Semipolatinsk region. However, at least three are known to have been conducted at the northern test site of Novaya Zemlya.

Prior to 1960 Great Britain had conducted twenty-one nuclear tests. Since 1960, four British nuclear devices have been detonated at the Nevada Test Site. However, because all the NTS shots have been announced by the AEC as joint United States-United Kingdom tests, they have been considered for purposes of this article as United States tests.

Like the Soviet Union and the United States, Great Britain has developed thermonuclear as well as nuclear weapons. Perhaps one reason why so few British tests have occurred in the last eight years is that Britain has a certain favored status whereby a considerable amount of nuclear weapons information is exchanged with the United States. This exchange of information is by no means total, however, and there is a great deal of U.S. weapons work to which the British are not privy.

The United States does not officially announce French nuclear tests, but fourteen are known to have occurred thus far. The most recent French tests have been aimed at developing a thermonuclear device. France is the only nuclear power which has not yet detonated a device with a yield in the megaton range.

China, the newest member of the nuclear club, seems to be the most precocious, at least insofar as rapid development of a thermonuclear weapon is concerned. However, the most recent Chinese test, which occurred in December of 1967, appears to have been somewhat of

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a failure. The device tested had thermonuclear components and gave a yield of about 25 kilotons, but little or no thermonuclear reaction occurred.

Not all nuclear tests have been concerned with weapons development. Through 1967, nineteen "peaceful" nuclear detonations had occurred in the United States alone. Since 1957, the U.S. has engaged in a program to develop the "peaceful" uses of nuclear explosives. In its earliest years, this program, code-named Plowshare, placed much emphasis on developing techniques for large-scale excavation with nuclear explosives. One of the more spectacular surface features at NTS is the 1200-foot-diameter crater formed by a 1962 100-kiloton Plowshare detonation.

The limited nuclear test ban, with its limitations on the spread of radioactive debris from nuclear detonations across national boundaries, has placed a severe crimp in the development of a nuclear excavation technology. Indeed, the Sedan experiment which resulted in that magnificent crater at NTS, would have been a clear-cut violation of the treaty had it occurred after the treaty went into effect. Nonetheless, work continues on developing techniques and explosives for nuclear excavation.

Feasibility studies on the best methods of constructing a sea-level canal to replace the present Panama Canal are nearly completed. If such a canal is actually built, it would entail the largest earthmoving job in history. Serious consideration is being given to using nuclear explosives for the job, even though it seems clear that the present treaty would have to be amended before nuclear excavation would be permissible. The attractiveness of nuclear excavation for this task is primarily economic. There are indications that nuclear excavation would be only a third to one half as costly as conventional excavation.

During the last four years, the Plowshare program has concentrated more and more on "contained" experiments, i.e., those in which there is no escape of radioactivity to the atmosphere. These

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Ballistic cases of the only two nuclear weapons ever used in war. In the foreground is Little Boy, the atomic bomb dropped on Hiroshima on August 6, 1945. In the background is Fat Man, the bomb dropped on Nagasaki on August 9, 1945. The explosive power of Little Boy came from uranium 235 while Fat Man was a plutonium weapon. The shapes of the two bombs are so drastically different because Fat Man was an implosion weapon whereas Little Boy used a "gun-type" assembly to cause the nuclear explosion. These ballistic cases are now on display at the Los Alamos Scientific Laboratory's Science Hall and Museum.

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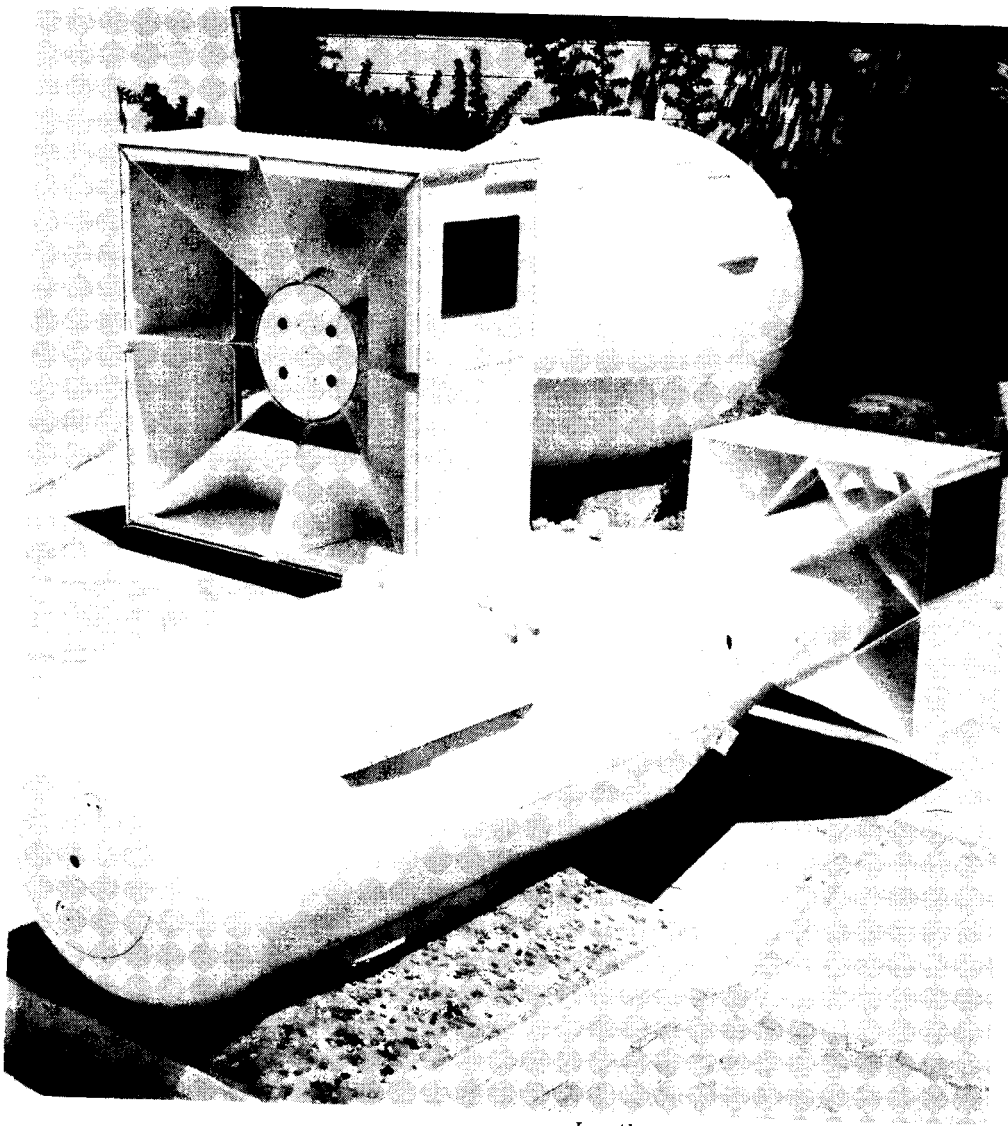

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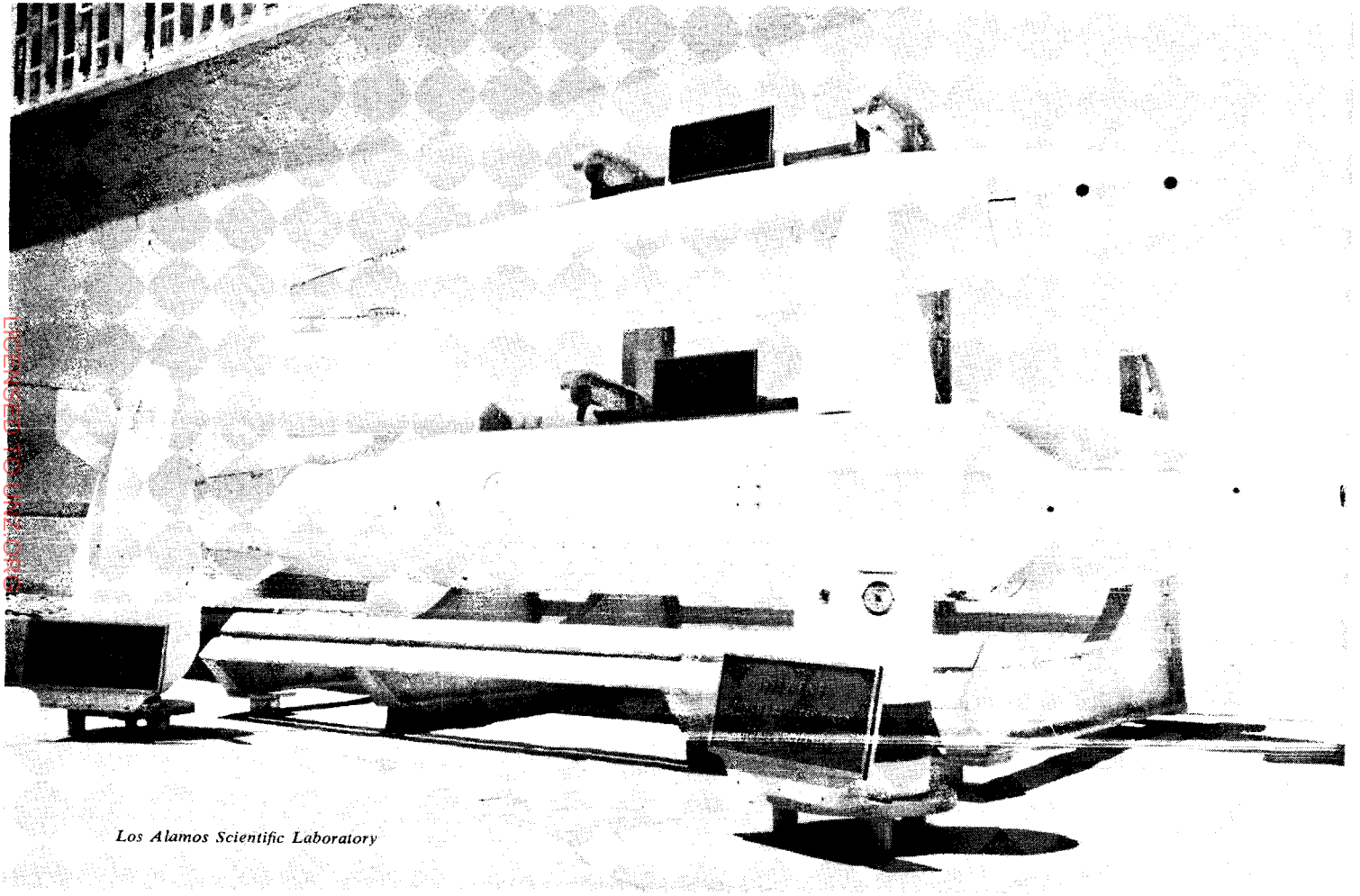

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experiments have varied from the straight scientific, e.g., attempts to produce new heavy elements, to the first serious efforts to develop the industrial uses of nuclear explosives.

In the latter respect, the Gasbuggy experiment conducted December 10, 1967, near Farmington, New Mexico, is particularly significant. The purpose of this experiment was to explore the feasibility of stimulating the production of natural gas from a gas well by using a nuclear detonation to extensively fracture and heat a tight gas-bearing rock formation. The experiment marked the first time that private industry has been willing to make a substantial investment in a Plowshare experiment. A number of firms, headed by El Paso Natural Gas Company, have committed more than a million dollars, primarily in services, to defray the costs of Gasbuggy.

Plowshare officials and scientists, who have spent much time and effort to dissociate the program from weapons testing, are faced by a curious dilemma. Specialized nuclear devices are required if Plowshare is ultimately to be successful. But when such devices are developed and tested, information thus gained is almost inevitably also useful in the development of nuclear weapons.

And therein lies the paradox. Plowshare, a program devoted to the constructive uses of nuclear explosives, finds that it cannot divorce itself entirely from the weapons effort. Those who think that nuclear explosives can and should be used for the betterment of mankind see a successful treaty which bans all nuclear testing for weapons purposes as also sounding the death knell for Plowshare.

It is not something, however, that either nuclear weapons or Plowshare scientists need fear in the near future. All present signs indicate that in the United States as elsewhere nuclear testing will continue unabated. In fact, the United States is now quietly preparing for the largest underground nuclear weapons testing program in history. ■

Ballistic cases of four nuclear weapons now on display at the Los Alamos Scientific Laboratory's Science Hall and Museum. In the left foreground is the Davey Crockett rocket, developed in 1961 and designed to be fired from a rocket launcher by a three-man team. At right foreground is an eight-inch atomic artillery shell developed in 1955. Top torpedo-shaped missile is a 1962 fission bomb while the bottom torpedo-shaped missile is a 1961 thermonuclear or hydrogen bomb. Davey Crockett has a yield of about four kilotons; the artillery shell has a yield of about two kilotons; the fission bomb has a yield of about 20 kilotons; and the thermonuclear bomb has a yield of about one megaton.

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The rites of man

It really isn't easy
to be rich,
handsome, wise, healthy —
and popular!

JOHN T. PHILLIFENT
Illustrated by R. Palais

When Colby Rawson came to think about it, much later, he realized that the aliens had chosen their moment with exquisite care. In fact they must have been watching us for three years or more before they decided to make themselves known. But that came afterwards, when it didn't matter a lot anyway. Colby's first involvement in the affair had nothing whatever to do with aliens in the accepted sense. It's true that he was in the habit of thinking of anyone "foreign" as being prefixed with the reference term "xeno," but that was just his habit as a result of his hobby, and he didn't expect anyone else to share it.

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He wasn't even thinking that far as he boarded the plane for New York that day in early March, 1972. Most of his thinking was absorbed in lesser details. Flight bookings to New York were pretty hard to come by just at that time, because of the feverish preparations for the Twentieth Olympiad, to be held in that city that year. Yet he had obtained a seat with no trouble. Unqualified leave of absence was hard to come by too, at any time of year, for him. But he had that as well. And he knew why, on one level, but he had no idea at all why, on another level.

The letter was in his pocket, addressed to him in the proper manner and bearing the letterhead of the United Nations Educational, Scientific and Cultural Organization. The signature was a scribble, but someone had thoughtfully typed it underneath as Sir Randolph Howe, adding a trail of initials as indication of his eminence. Rawson knew, already, that Howe was Director General of U.N.E.S.C.O., but that knowledge didn't help any. Nor did the text in between. It merely informed him that he was requested to attend an extraordinary meeting of the Organization, that facilities would be arranged, and that they would be grateful for his presence and so forth. But not why they wanted him.

A parallel letter must have gone to his department head, because the wheels had certainly been greased—no questions, at all. Rawson badly wanted to ask some, but he was by habit a man of intense curiosity coupled with tremendous patience. Questions could wait until he was right there at the meeting. Asking anyone else would be just asking for confusion. But he couldn't help thinking "Why me?" He was no further forward on that by the time the meeting actually came to order. The venue was in no way unusual, a room pretty much like any other board room, with a polished table perhaps a shade larger than he had ever seen before. But the people round that table were out of Rawson's caliber altogether. He recognized Howe at once, and the men either side of him. Also one or two of the assembled savants. And he could guess at one or two more.

A strange breed, he thought, making a covert study of the faces. People of learning and intellect, skilled in the arts and humanities, who had somehow made the uneasy side step into seats of power. They had a common air, of disillusionment and determination not to show it. Without claiming any great insight, Rawson was as curious about the inner workings of other people as he was about anything else. It was his habit to apply a touchstone question. "What is he (or she) after?" It got results often. He could have applied it here, but Sir Randolph Howe began making signs of movement so he had to re-

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vise it hurriedly, to make it plural. "What were *they* after, right now, with him?" He was about to find out. Howe leaned forward to mutter at the men to right and left of him, nodded a time or two, then braced on the arms of his chair and got erect.

"Formalities," he muttered. "Get 'em over with. Policy Council in session. No other business. Welcome to our guest, from whom we expect much." A nod and a brief smile for Rawson, then a cough. "By way of getting into it, propose to read this." Howe took up and waved a folded journal at his colleagues. "*Education,* a monthly magazine, this is the March edition, this year. Now!" He halted again to take breath and peer. Rawson caught his start of incredulity before it could show, not sure which was the least credible, that such a journal should have reached this eminent audience, or that they had read and understood his piece.

" 'The more the conflict of ideas, values and opinions continues to grow between the various races, nations, creeds and social groupings, the more it becomes obvious that we need a new algorithm, a calculus of relationships. The computer, that ubiquitous, impersonal and almighty aid to understanding is failing us in this regard simply because it has never been tried. It has never been tried simply because those whose business it is to study and deal with relationships do not know how to express them in calculable form. They do not know how because they have never tried. They have never tried because they do not believe it can be, or even ought to be, done.' " Howe paused to aim a hard glance at Rawson over the edge of the journal. Rawson met it as steadfastly as he could.

" 'They are quite right in this belief,' " Howe read on. " 'It can't be done, by them. But it can be done, per se. What is lacking is the approach. What is needed is the combined knowledge, skill, understanding and application of sociology, social science, mathematics and formal logic to the end of working out and perfecting a calculus of relationships. Whilst such a technique does not as yet exist, it is possible to define and describe what it would do, and how.' "

The reader coughed again, dropped the journal on the tabletop and fastened his pale blue gaze on Rawson.

"You know the piece, Rawson. You wrote it. Next part, complex mathematical treatment, you probably understand that, yourself. I don't. We've all read it, or had it read to us. Can't say any of us understand it properly. But we feel maybe you're . . . what do they say . . . on to something. Can't be sure, though. Perhaps you could explain this calculus of yours. Words we can understand, hm-m-m?"

Howe subsided. Before Rawson could collect his aplomb properly

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the man to the right of the chair produced a smile that gleamed against his Asiatic tan and offered a comment.

"We have checked up on you, Mr. Rawson. You teach history of science in high school, to what we used to call 'teen-agers'. I believe the more preferred term is now 'junior citizens.' Yes? Your talks are popular, your classes well attended, and your pupils get good grades. I ask: do you teach *them* this calculus of yours?"

Rawson got to his feet, not so much from respect as the fact that he could and did talk better when standing, especially if his audience was seated. And this, he realized, was one time he needed all his powers.

"I'm grateful for that question," he said, with a nod to the brown-faced one, "because the answer to it will help explain other things. The answer is, no, I do not teach anybody the calculus. The reason? Simply that the calculus does not exist yet in any hard form. In the same way an artist may be able to draw in perspective without knowing exactly how he does it. He knows it can be done, but he can't teach it. He needs to do some self-watching and analysis, if he is capable of it. On the other hand I have been using the calculus in teaching for many years. I use it in the same sense that I am not, now, teaching you spoken English, but I am *using* spoken English to talk to you. It wasn't until I started studying my own methods and habits that I realized they could be formalized into a kind of routine. Once I got that far I knew the rest could be done. But I can't do it, any more than a man can see what he looks like when he's asleep by staring into a mirror with his eyes shut."

He waited for the murmurs to die down then went on. "Let me come back to that analog about language. There are those who speak and write English. That's almost everybody. Then there are those who teach English; that is, they teach grammar and syntax and the proper use of accepted rules. They will tell you how it ought to be. Not so many of those, but a lot, just the same. And then there are a few who actually study the language as it is. Why it is? What makes it work that way? They don't make rules. They discover them inherent in the subject matter. Now, let's apply that to relationships. First there are the people who have to deal with other people. That's just about everybody. Then there are those who try to teach us how to get on with people, the way it *ought* to be. That's the grammar and syntax, and, just like real grammar and syntax, it doesn't work out in everyday usage, only in pedantic theory. And then—there aren't but there ought to be—those who study the actual facts of relationships to find out what the built-in rules are."

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"Excuse, please." The interruption came with a gentle Oriental inflection. "You are broadening the field, sir. We here are concerned with national ideological and social groupings, not individuals. Not with the everyday conflict of one man with another."

Rawson shook his head firmly. "First basic factor, so far as I have unearthed it. To every sentient individual, every other life form is a stranger, an unknown quantity, an alien and a potential enemy. That's the first thing. It can be changed later, in the light of experience, but it starts like that. Primary relationship. In a clumsy way I have been able to diagram this. A geometry. That's why, as you'll have read, I've called it Xenometry."

A distinguished Hungarian field-anthropologist, away to Rawson's left, snorted gently and protested: "I don't think you are saying anything, sir. What does it amount to? One still has to study people and estimate their values and actions!"

"No, sir!" Rawson was firm. Inside he was afire with zeal for something to which he had given hours of careful thought. "Let's try another analogy, a crude one but effective. On my left, here, is a large and very heavy metal object, an artifact with complex uses. It is an office safe, something that calls for a great deal of understanding. On my right, now, another massive and complex object requiring much skill and understanding, a mechanical hoist. You could spend a lot of time studying both before you proceed to the question, will this move that? It could take a long while, with highly involved and esoteric points. Now, let me introduce a man here who knows virtually nothing at all about either object. He merely glances at them. He concentrates, instead, on the cable between. On the relationship. It's right there. He applies his own instruments. He measures. And on that alone he knows enough. He knows the break-strain of the cable, he knows the force pulling that way, the resistance this way, and he can tell you, positively and for certain, 'It won't work. The cable won't do the job. It will part!'

"Don't dismiss it too quickly. I repeat, merely by studying the cable, that is, the relationship, he can tell you what is happening and what is going to happen. He doesn't need to know that the safe is considered to be burglar-proof, or that it contains a payroll. He doesn't care whether the hoist is steam-powered, diesel-electric or whatever. He is measuring the immediate forces involved, and that's all he needs. My contention is that the relationship forces between one individual and another—or between one group and another—can be studied and calculated in exactly the same fashion. And you do *not* need to know *all* about the entities at either end. All you need to know are those forces which immediately

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affect the relationship between them."

Sir Randolph Howe cleared his throat noisily. "Damned if I know, Rawson, whether you're being profound, or meaningless. Concentrate on relationships, you say. Aren't we doing that already?"

"No, sir. You are trying to understand people. My own personal opinion, for what it's worth, is that it can't be done, not completely, but I wouldn't stop anybody from trying, all the same. My point is that as soon as you try to understand somebody you are setting up a series of relationships with him on one end and you on the other. Whereas if you go for the relationship itself, between two other units, you remain neutral. The man driving the hoist wants to move the safe. The people owning the safe want it moved. But the man studying the cable isn't involved at all. He just knows it won't work, no matter what they want."

"Hm-m-m!" Howe began to get that glassy-eyed look that Rawson knew well as indicating cessation of comprehension. "Reduce human relationships to a set of diagrams and figures, hey? Can't be done!"

"How do you know?" Rawson challenged. "Has it been tried?"

"The idea is inherently repugnant." The comment came from an Italian professor of philosophy, and Rawson gave him a mean smile.

"More repugnant than famine, national neurosis, racial conflict?"

Howe coughed loudly to cover the mutter of distress from the audience. "Talking politics now. Thought you were neutral?"

"To make xenometry work, one has to be."

"You think it will work?"

"I know it does. I use it. If you mean can it be codified, refined to the clarity of a formula, I think so. I've done a deal of work on it, but of course my time and resources are limited."

"That can be changed. You'll consider a commission?"

Rawson sat, rather more suddenly and heavily than he intended, all the springs in his legs suddenly soft as the implied offer struck home. For once in many years his natural caution was drowned in the glow of realizing that he might, at last, be able to work on his beloved theory.

"You're offering me a commission, to work on xenometry?"

"Right. We're agreed it sounds worthwhile. Lord knows, we need something like this. You need time to consider, or shall we talk terms now?"

Rawson took just one breath, then cast the die. They talked terms. They invented and brought into being the Independent Xenometry Commission, gave it to Colby Rawson, voted him a budget that was two orders of magnitude larger than he would have dared suggest by himself, and promised all sorts of cooperation; case-history material, discreet plugs of support here

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and there, premises, computer-access, and freedom.

"Responsible to me," Howe told him, "but that's purely nominal. Shan't try telling you what to do; wouldn't know how. Want a progress report now and then, that's all."

After the first fine flush of bewilderment had died, Rawson realized he had a lifetime of work ahead of him, but he didn't mind. He plunged into the challenging task of transforming small theories into growing utility, and put his suspicions away into the back of his mind. It was a year later, almost to the day, that those suspicions were evoked again, a year in which he had created the nucleus of an organization in the shape of Charles Wainwright, a statistician with a genius for operational research, and David McDaniel, a man who thought of computers as natural brothers and nicer to live with than people. It was also a year in which Rawson had traveled more, talked more, and explained his theories more than he had done in all his life to date; a year in which, with the aid of his two fanatical assistants, he had produced a code, a questionnaire that had gone to hundreds of thousands of those people who had anything at all to do with relationships between one person and another. A good year. Until the letter came.

It was on his desk, opened and ready for his attention, as he came into his office that morning. He read it once in shocked unbelief, then again in chill rage. Then he took a deliberate minute to recover calm, and buttoned for the office below, and Charles Wainwright.

"Charlie. Get me a picture of the Olympic Games. Just the general concepts, what they're all about and how."

Wainwright's face in the desk screen showed a grin. He said "Five minutes, maybe," and switched out.

Rawson used the time to review what he already knew. An international, independent organization. Once every four years. The Games awarded to a city, by the committee. The Nineteenth Games to Mexico City, and the controversy over altitude. The Twentieth Games to New York. He remembered *that*, although he hadn't paid much attention at the time. And the next games?

Wainwright buzzed and came on. "Want it in print, or shall I read it out?"

"Just a couple or three points will do. Just how independent is the selection business?"

"Total, it says here. *Comite Internationale Olympique* members elected by the committee, for life, only three members from any one country, and they represent the C.I.O., *not* their country. Are held to be above politics or nationalism. The idea is to promote better understanding through friendly physi-

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cal contests. Sounds nice, doesn't it?"

"Sounds ideal. Who decides where the games are to be, and when do they decide?"

"Decision taken by the C.I.O. Award is to a city, not a nation. As for when"—Wainwright frowned, staring at something off camera—"the routine is to decide the next venue at or shortly before the present event. Makes sense, because there's a lot of preparation involved. But, so far as I can find, no data on the next one. Funny. I must have missed that—"

"You didn't. They couldn't agree on it. Split right down the middle and no hope of agreement."

"Where'd you get that from, Colby?"

"My desk. This morning. Is David there? Get him in the picture." Rawson waited for McDaniel to arrange his lantern-jawed face in the light and then waved the letter for them to see. "From our patron. Now we know the real reason why we have been set up. Listen. 'At the last official meeting of the Olympic Games Committee one half of the membership voted to award the next Games to Peking and the other half . . ."

"Peking?" McDaniel snorted. "What kind of rubbish is that?"

". . . And the other half was solidly opposed, with no prospect of a compromise. Some considerable time has elapsed without hope of a decision, and the matter becomes urgent. I am informed that the Committee are willing to accept the casting vote of an accredited independent authority and have asked the U.N. either to intervene or suggest a solution." Rawson let the paper fall. "It's the standard jargon, the gist of which is that Howe is passing the buck to us, and, without actually saying so, wants us to confirm Peking. Me, anyway."

"Why not?" Wainwright commented. "Red China's no bogey any more, not now. Glorious Mao's been dead these five years and the country's in a hell of a state, struggling like crazy to catch up on a couple of decades of misrule. Trouble with China, they never had a slave class—"

"What are you talking about?" McDaniel cried. "Since when has slavery been the doorway to salvation?"

"All the time. Look, slavery is a stage any country has to go through in order to create a privileged class, in order to take off into the development and progressive stage. It's one of those things. Inequality—"

"Forget it," Rawson cut in harshly. "Sociological theories can wait on some other time. I've nothing against China being admitted to exist. From what little I know her rulers would be only too glad to be recognized and given the chance to join the capitalists, like the Soviets. What holds them back is 'face'. They're waiting to be asked. But that's not the point. The point is,

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we've been used! The dates will tell you. One week after the final abortive meeting of the Games Committee Howe sends for me and pushes this hot little gift into my hand. And now he expects me to cast the vote for him."

McDaniel scowled. Rawson could almost see the computations going on. Then he nodded. "The probabilities certainly point that way. Crafty beggar."

"What do we do?" Wainwright demanded. "What *can* we do? If we throw him down we might as well fold up and go home, that's obvious. He holds the purse strings. Whereas, if we play along this once, we still have the operation. Is it worth it?"

Rawson thought hard. Partly he was bitter at the thought of being set up as a patsy, a convenience to further Howe's political chicanery. And that was further soured by the knowledge that Howe hadn't believed in him or his theories, possibly hadn't even begun to understand them, probably thought him some crackpot crank. But there was the part, too, that winced at the idea of losing all he had built, the part that was convinced he was on to something valid and valuable. He balanced it out.

"We play along," he told them, "because we need Howe's patronage. But he needs us, too, and he is going to pay for that. I'll handle it." He cut them off and buzzed for his secretary to come in. "And bring your key box, Miss Everard," he said. "I've a letter to go by wire."

Jo Everard was one of the nice things that had happened to him during the year. Apart from the fact that she would never see forty again yet insisted relentlessly on trying to appear twenty-five, he could find no fault with her at all. She was quietly efficient and he had yet to ask her a question to which she either did not know the answer, or didn't know where to get it. She sat herself now by the end of his desk, plugged in her keyboard, set up the controls, and crossed her still eye-worthy legs with quiet abandon. He slid the offending letter across to her.

"Him," he said, and watched his screen as she performed the preliminaries, squared off the page, zoomed it close, and touched buttons that made the letterhead and conventional greeting grow into crisp outline on the paper. Then she waited, fingers poised, ready to command the shaped charges of static electricity that would whirl a mist of carbon dust and fixative into the black symbols of his thoughts. He scanned what was there absently, arranging his mind. "Sir Randolph Howe. Dear sir. Referring to yours of yesterday—

"It is the considered opinion of the I.X.C.," he began, "that awarding the Twenty-first Olympiad to Peking will serve to emphasize and further the aims and inten-

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tions which are the fundamental purpose of the Olympic Games." That much was safe, and flowery enough to satisfy anybody. "However," he drew a careful breath and went on, "this opinion, in the name of the I.X.C., is offered only on condition that properly qualified and authorized representatives of the I.X.C. are assured priority of access and all facilities to observe, study at first hand, and thus be competent to give advice on all newly created interrelationships arising from the acceptance and implementation of the aforesaid opinion. *Yours—et cetera. Three copies.* Fax one to him right away, and two for files." He took the light-pen from the clip on the side of the screen, waited a moment for the conventional phrases to appear, and then appended his signature. "That's all," he told her. "He'll probably call, so you'd better stand by, shoot the call straight through here, and get a record of it."

She trotted out, and he pushed the screen down flat to his desk top, out of the way, and released a long slow breath. This was it. Either Howe would tell him to go jump, or he would comply. In one case, it was all over. In the other—? Rawson set himself to work out just what he would need, and this time there was no timidity about his visions. More staff, a lot more money, and some genuine authority, the kind that couldn't be negated later, in the event of some official's displeasure. "You caught me once," he muttered. "I'll see you don't catch me again, not like that!"

Miss Everard's warning buzz pulled him out of a growing complexity. "Call for you, from Paris. The one you were expecting."

He levered the screen up, touched a button, and Howe's jowly face looked at him with a frown.

"Morning, Rawson. Just got your letter. Funny tone. Conditions?"

"I consider them necessary. The casting vote of the Commission will trigger off a situation that will create considerable backlash. It's a big *responsibility. I can't accept it unless* my people have some degree of control, at least to observe and advise."

"You mean you *want* to be involved?"

"Isn't it natural? This is exactly the kind of thing we are supposed to be studying."

"Hm-m-m!" Howe half-closed his eyes in momentary thought. "Hadn't struck me quite like that. Sort of watching brief, eh?"

"That kind of thing, yes."

"Don't like it." Howe opened his eyes wide. "Might sound odd, coming from me, but I don't believe in charity. Makes no sense. Would rather pay a man well for doing a job than donate him money for doing nothing. Listen, nobody has any official standing in this business, outside the Games Committee—not even me—so, I'll reverse your notion. Never mind the watching

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brief. I'll have your Commission put up as official arbitration and advisory on all tangles and disputes that may arise, other than those pertaining to the actual athletics. All right? Either your techniques work, or they don't, and this is your chance to demonstrate."

Rawson was caught, and he knew it. With a straight face but hollow insides he agreed, thinking that it served him right for trying to put one over on a seasoned old campaigner like Howe. He broke the news to his companions and watched them sag. Then, because there was nothing else for it, they got set to work it out. This time it was work that made the previous year's efforts seem like a rest-cure. Rawson went short on sleep, became irritable often, developed all sorts of dodges for evading the wrong kind of publicity, spent hours revising code systems and arguing with his colleagues. He brought in extra help as fast as he could find suitable people. He acquired large maps and watched anxiously as red pins went in wherever he succeeded in setting up a local subagency to observe and report.

Miss Everard began to drown in a flood of correspondence and gathered a staff of her own to cope. The first tiny trickle of success grew into a steady stream as Rawson saw a new breed of person emerge into the sociological scene. Mediators, these were men and women who really could mediate, who could spread soothing oil on the most stormy waters because they were armed with a technique that worked almost as prosaically well as sprayed water puts out a fire. On the strength of the record he demanded a special-purpose computer for the Commission's exclusive use, and got it. Then he demanded autonomy, independent existence, freedom from dependence on the U.N., and got it. He grew a few premature gray hairs and acquired lines on his face in the process.

Not until he was safely over the hump and knew that the Commission was a safe entity did he so much as admit to himself how near it had been to a total and horrible fiasco. To parlay half a dozen insecure axioms and a shaky body of theory into a pilot-study, and then, virtually overnight, into a world-wide authoritative agency, was a gamble that should never have been begun—but he had made it, and he had it made. And, after all, he could feel that it had been worth it.

It was at that moment, with exquisite timing, that the real aliens chose to make themselves known to the world. With the Olympiad only a year away, with Peking in the throes of construction, conversion and preparation, and beginning to stand high on the travel-folders of vacation-organizations, and almost all the diehard indignation past, it was a morning for Rawson to stop off at the analysis floor for

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a word or two with McDaniel before going on up to tackle the mail.

"How's the language problem coming?"

"We're getting it into shape." McDaniel showed him a chart. "The German-Austrian group is the toughest, so far. Most other nationals take fairly well to the 'me humble, you great man' routine, because they grasp that it's just a con, a phony humility. But the Deutchlander just can't take that. Australians don't wear it very well, either. It's tricky."

"Yeah," Rawson mused. "There's a lot in the spoken tongue, when you start digging into it. Unconscious wisdom, almost. You get skew relationships without half-trying, and yet, when somebody is really paying heed, he will say 'On the level?' Some kind of instinct tells him that's the only kind of relationship that counts. I wish more people could read diagrams. Why don't they teach them to, in school?"

"Have a heart!" McDaniel chuckled. "They have a hard enough time just teaching them to read simple English."

"Simple? One clean diagram will tell you more than half a dozen pages of the purest prose. Hah! I'm never satisfied."

"Would any of us be here, if we were? You want to hang on a moment for the world news? It's just coming on." McDaniel flipped the switch on the wall screen and sat back. To a muted fanfare of trumpets there came the beaming face of the newscaster against a Mercator's projection. He opened his mouth to begin, and the picture tore up into shivering shreds of color. The sound died. In a moment the chaos steadied, and Rawson opened his eyes wide. This was another face, also smiling, a handsome face, glowingly tanned, with even white teeth and black hair swept back unfashionably long. The backdrop, just out of focus, hinted at instrumentation. The man wore, from his chest on up, a simple, sleeveless, cream-white tunic with a square neck line. An unfamiliar insignia glittered on his right breast. Even before he spoke, it was obvious he was not of Earth. His first words confirmed it.

"Peoples of Earth," he said, "I am Danvar. I am speaking to you now, in each of your many languages, from a vessel which is in orbit about your planet. It is one of three, and we are approximately one thousand miles above your surface. Your astronomers and other observers will be able to confirm this. My message is a simple one. For some time we have been watching you, listening, learning something of your languages and ways. We mean nothing hostile. We would like to visit your planet, to be friends with you and learn more about you, before going on our way. We can do this only if you wish it. I will speak to you again in one hour. At that time I will ex-

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plain how you may reply. Until then, good-bye!" The picture held for a moment then tore up and was replaced by the standard transmission service, catching the newscaster off guard and huddled away to one side of his desk clutching a telephone.

Ignoring his babbled apologies and confusion, Rawson looked at McDaniel, then craned round at the staff of the analysis room, where they had come to stare. What he saw on their faces confirmed his own thought.

"No hoax, that. It was genuine!" he said softly.

"Genuine?" McDaniel demanded. "That was tremendous, I'm telling you. That laddie is an expert. Did you get the tones, the phrasing —and that the lip-movements were out of synch?"

"I noticed that," one of the statisticians volunteered.

"Translation machine," Rawson suggested. "Danvar was speaking his own tongue, and the machine was simultaneously broadcasting it in several different versions. You could hear the muttering." There came urgency from the television speaker and they paid attention.

" . . . Taking you direct to Palomar for an expert comment—" the picture shimmered before he could name names, and showed a lean-faced man, wide-eyed with excitement, his sparse hair standing up in spikes.

"It's true! There are ships up there, big ones! Three, in a thousand-mile orbit! We'll get you more details just as soon—"

McDaniel hit the cutoff and swung on his chief, almost as wide-eyed as the astronomer.

"This is it! This is where we really shine!"

"No!" Rawson declared violently, and Wainwright, coming through the throng of staff and shushing them back about their business, was in time to nod.

"I'll go with that. This isn't for us. Right now I will bet you that every security organization on the face of the Earth is boiling. Monarchs and military men, statesmen and public figures of every color and creed will be fighting their various ways to telephones, and meetings—"

"And the scientists," Rawson murmured. "Just think of the scientists! And the cultists! The fanatics! No, we keep out of this. It's not in our league, at all."

McDaniel pulled down one eyebrow in stubborn disagreement. "I will bet, any odds you like, that they will have to send for us to sort this out. You will see if I'm right. When fools fall out the honest man comes into his own."

"You made that up," Rawson grinned. "All right, we'll see. But just for now, pass the instruction along in case anybody rings up. We do not have an opinion, at all, on the aliens!"

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He didn't expect his fiat to halt speculation among the staff, but he steered clear of it. That Man would someday make contact with alien intelligences was something he had taken for granted long ago. Now it had happened, he felt saddened, if anything because he knew, from experience, that it is the rare pupil who will work his way right through a problem when he knows the answer is in the back of the book. Just by being here, the aliens were demonstrating that they had the answers to a lot of problems mankind was just starting to work on. But he also knew that his viewpoint was a minority one, so he kept it to himself and found work to do. There was plenty of that. Chinoiserie was booming. Small opportunist workshops all over the country were selling "genuine" lacquerwork artifacts as fast as they could knock them out. People were rediscovering tea, and bone china tea services. Oriental galleries were dusting off their "House Full" signs. Everybody suddenly wanted painted screens. All these symptoms were reactions to be weighed and codified and balanced with appropriate factors. Soon, he thought, there would be a whole spectrum of new factors, if the aliens landed.

He took it for granted they would, but it wasn't to be as easy as that. Danvar came back to repeat the substance of his message and specify a wavelength that would get through. He made it plain

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that there was no hurry, and that was just as well. After a crazy twenty-four hours of wild rumor and even wilder counter-rumor, the leaders of the various nations and factions got together enough to impose a total ban on all open discussion of the aliens. And then the whole world waited, chewed its collective fingernails, and waited, for nine dragging days, while admirals and generals and professors crowded into hot and rowdy conferences with politicians and statesmen, and failed to agree. Like everyone else, Rawson waited, and thought, and refused to join discussions with his staff. Opinions, he told them, were valueless without data.

It was on the ninth morning, while he was admiring a set of transparencies sent by his man-on-the-spot in Peking, that his desk-phone buzzed. He put down the slide showing the part-built Olympic Village "just beyond Hsi-chih Men, the northwestern gate; you can see the old Summer Palace in the background," and pushed the button to acknowledge.

"This one you have to take," Miss Everard said. "It's the Secretary-General! The United Nations—?"

"All right." Rawson pushed away the pictures and sat forward. If the aliens did nothing else, they had succeeded in transforming the United Nations from a feeble joke into the only concrete evidence that Earth was, in fact, one world. "Put him on." He would have recognized Dr. Julian Mendoza at once, in any case, but the past week had engraved new lines on that careworn face, and the well-known smile was absent.

"Good morning, sir. This is I.X.C. and I'm Rawson. Is there anything I can do for you?"

"I would like you to attend a meeting. In half an hour, perhaps?"

"Do I bring anything with me?"

"Only the remarkable talent you seem to have for settling disputes. It was never more needed."

"You're welcome to that. I'll be there."

It was easily the most prickly gathering he had ever attended. In a room adequate for maybe twenty people there were at least twice that number, and more than half of them were in uniform of some kind. His arrival made a moment's halt in the muttering that swelled up again as he joined Mendoza on the small dais and cast his eyes over the assembly. War Ministers and generals, diplomats and doctors, scientists and statesmen, and mutual distrust was thick.

"I challenge this man's competence," a Russian uniform stated, before Mendoza could perform introductions. "What does he know, more than we?"

"Not a thing," Rawson told him. "But I know how to find out."

"You some sort of scientist?" This time the gold-braided uniform was American.

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Rawson smiled. "Not the kind you're worried about. No. But I do have training. It helps to ask the right questions. Let's decide just what it is we are trying to achieve. Do we want them to land, or not?"

"Dear sir," Mendoza sighed, "if we could answer that, we would not need your help at all!"

"All right, try this: They say they won't act unless we ask. Assume they mean it. Then assume we tell them to leave. And then assume that they do. And then what?" As simply as that, Rawson found he had achieved total silence. He waited three breaths, then. "Isn't it obvious we have no way of knowing whether they have really gone, how far, how long they'll stay, whether or not they will come back? Or anything? So that washes out one alternative, doesn't it? So it has to be the other."

There was clamor, a fitful uneasy storm. He waited for quiet. "You say safeguards. Such as what? Here go the alternatives again. Either they have superior weapon technology, and there's nothing we can do about it. Or they haven't and what are we worried about? Three ships up there and five billion of us down here. If they aren't afraid of those odds, should we be? If they were going to take us, would they wait up there for an invitation? Why not wipe off the sweat and try assuming they mean just what they say, a friendly visit? Tourists! Or do we have something to hide?"

Then he sat back and listened to them sneering at each other. And he waited for the word "tourist" to sink in and work its greedy influence, as he knew it would. It was the old key-question's reciprocal form "What do I get out of it?" It worked to the point that they wound up broken on only one issue. Who would do the inviting?

"I can *not* do it," Mendoza denied, "in the name of the United Nations. We are not negotiating a treaty! If we are to regard them as visitors, as tourists, then we must treat them as such."

"Make that a conducted tour," Rawson suggested softly, "and I.X.C. will handle it. We have the key personnel, and the know-how. And no ax to grind." Then he added. "But there will be conditions!"

They didn't care for it at all. There were moments when they couldn't decide who to come to blows with, each other, or him. But they were over a barrel, and eventually they had to admit it, and listen to him.

"Don't think I want this," he told them, "because I don't. I would just as soon go back to teaching school. But this happens to be my planet, and I want the aliens to get the right impression. I have no more data than you do, so a lot of this will have to be played by ear, but there are a few ground rules to start out with. First: myself and/or trained members of my staff will be present at all times to observe all

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contacts between human and alien. Nobody is to make, or try to make, any kind of contact whatever unless one of my people is present. That is basic and unless you people can guarantee me that the deal is off. Right off. I aim to eliminate any and all backdoor deals, diplomacy, private hornswoggling and skulduggery of all kinds. Do I have to develop that?"

"We keep still while you line your pockets?"

"We're after information only. We will issue whatever we find out, in regular bulletins, to everybody. You can help there, too, by making it known that nothing is genuine, authentic, unless backed by us. Look"—Rawson put an edge on his voice—"this is a challenge. Can't you see it? We're up for inspection. D'you want to foul it up? I want to be able to tell them what they want to know, show them what they want to see, take them where they want to go. It's up to you people to make up your minds, fast, just what you *don't* want them to see and know about. And then let me have the list so that my people will know just where they stand."

At that point he was done, but the meeting squabbled on for an hour or more, reluctant to settle anything without debating it into the ground first. Nothing was changed. By noon he had been ushered into a tiny studio hot with lights, facing a camera, fussing technicians hovering close, and a press of anxious faces watching him through glass. The first man to communicate with an alien intelligence, he mused, and wondered what he was going to say. As a well-known face grew on the screen he smiled at it.

"Unless you people all look alike, you're Danvar. Right?"

"Yes. And you?"

"My name is Colby Rawson. To clear an immediate point, *what* are you? Captain of your vessel, leader of the expedition, or what?"

"My function is to make contact, to understand and explain one to the other. An intermediary. And you?"

"About the same. This is the first time we of Earth have made contact with other intelligences and we're not sure how to go about it. We would like to ask you down, but by easy stages at first. Is that all right with you?"

"We do not wish any trouble. How can we help?"

"Do you," Rawson wondered, "have something small, a craft to hold six or eight people, that you could put down?"

"Yes," Danvar nodded. "We have such a craft. It can land—the right word?—on the sea surface if necessary."

"It's the right word," Rawson grinned. "And the right idea, too. We would have one lulu of a traffic problem if you came down anywhere else. I'm speaking from New

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York, if you know where that is?" Danvar nodded, and Rawson chalked up another mark to them for being informed. Languages, geography—what else did they know? "The building which houses the assembled representatives of all our people is in this city. If you could land at the mouth of the river, we will arrange to have your craft escorted to a docking place. All right?"

"It is understood. Our craft is mobile on water equally. At what time should we arrive?"

"Can you make it noon tomorrow?" Rawson suggested, and knew a twinge of uneasiness at Danvar's immediate understanding and agreement. Surely this was just a shade too easy? His apprehension prompted a question.

"I should have asked earlier, just where are you people from?"

"The question was expected," Danvar smiled. "I answer with care. You have people who travel always from one place to another? We are like that. Recently we have come from a star-group known to you, which you call the Bear. Five major stars together, all within eighty to one hundred light-years from here. One you call . . . I think . . . Mizar? Is this understood?"

"Not by me, but there'll be others to listen to this and know. Do I gather that this star-group is not your home?"

"That is true. My home planet circles a star much more distant. It is but one of what you would call a federation, with many hundreds of planet systems. My friends here with me are from several different planets. This is a complicated matter, about which we can talk at length another time. I must cease now as there is much to be made ready for tomorrow. I say goodbye."

Mendoza met Rawson at the studio door. His fine-drawn Mexican face was a study in quiet wonder. "My friend, either you are the most accomplished actor, or you have the genuine gift of simplicity. You spoke as if to a good friend and colleague!"

"That's about what he was, if you look at it. But he's no simpleton, believe me. I know when I'm being handled, and that was one time. If the others are as slick . . . oh brother!"

For all his curiosity, and his strictures about behavior, it was more than forty-eight hours later that he had his next chance to talk to Danvar in anything approaching intimacy. There just was not any way of persuading the assembled dignitaries of Earth's nations from their determination to extract the last desperate squeeze of prestige from the moment. Of all the billions who watched and marveled, probably only Rawson and his trained staff were not caught by the technology, or the wonder. They watched the people, of both kinds,

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watching for reaction-patterns. The technology was impressive enough.

The alien ship, a sleek ovoid some seventy feet long and twenty feet through at its thickest, slid over the water and alongside the place appointed for it with no visible means of propulsion, its hull one unbroken skin of polished metal that was mirror-bright. Rawson, jostled by gold braid and distinguished orders, saw with his own eyes how the odd craft grew a slim protuberance from either end, watched the metal-pencils extend, and loop, and secure themselves over ballards, and then fall slack just like so much silvery rope. And he spared a wry moment to think of the engineers and technical experts who would be glaring, and wondering.

But his moment came when a dark rectangle formed in the curved hull, and a flat metal tongue slid out to touch down, and the aliens appeared. They came stepping briskly, one in the lead and the rest two by two, seven of them, blinking at the flashbulbs, trying not to be too aware of the goggling T.V. eyes. Danvar in the lead, and the rest were evenly divided, three men, three women. Rawson got one good look before the pushing and shoving got out of hand. His overall impression was of ordinariness and normality, slightly undersized if anything. The men about five ten or eleven, the women somewhat less. And all dressed alike, starkly simple in cream-white tunics of stuff like heavy silk, sleevless, devoid of frills and ending at mid-thigh. They strode in soft sandals, they were devoid of ornament, or paint. Utterly ordinary—and yet they glowed with total well-being and serene self-confidence.

Rawson kept that image, and dwelt on it carefully, ending up convinced that someone had worked hard and long to achieve such a perfect impression. In the melee that followed he managed to nod and smile briefly at the six and swap brief words with Danvar.

"Excuse the enthusiasm!" he shouted, over the din of tongues. "It's a first time, for us."

"Understood!" Danvar shouted back, beaming. "And expected. I will see you soon, and we will talk, yes?"

And then, because there was nothing to be achieved here anyway, and because he always felt stifled in a crowd, Rawson returned to his office, to find his analysis staff in a mild ferment. Jo Everard was emphatically in favor of what she had seen.

"They're wonderful people. So neat . . . and . . . well, just wonderful!"

But McDaniel had a different slant. He came with a chart still warm from the print-out and spread it for inspection. "Look at this!" he jabbed his pencil point at one factor after another. "Normal. Nil. Zero. Neutral, all down the line. And this one!"

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Rawson eyed it, raised a quizzical stare to aim at Miss Everard. "You'd agree, I think, that the high priests of haute couture are busy, right now, throwing out their designs for next season's style, and tooling up for the Greek tunic look, eh?"

"Trouble with you, you're a cynic!"

"Maybe, and it won't be any change. But you're going to find it tough. No foundation-assists, no makeup, no amount of artifice, is ever going to get *that* kind of look." As her face fell he pushed home another point. "You will also notice that all seven of them dress exactly alike, even to the swept-back hair style. That's the other side of the coin of sex-equality, isn't it? That's one we haven't even looked at, on this planet. How d'you like that?"

She didn't. The more she thought of it, the less she liked it. And McDaniel duly noted it as a datum on his chart. There was quite a lot of odd weighing on the master chart by the time Danvar was able to call and talk. He shook hands formally, smiled at Jo, and made no secret of his pleasure at a moment of quiet.

"Such enthusiasm, so many people, the words, the things to see—it is good to be quiet."

"You've been busy?"

"More than we imagined. Parks, monuments, boat trips, houses of business, theaters, food—and people. Eight million people in this one city, and all eager to show off."

"National characteristic," Rawson grinned. "Now, what's the next move?"

"What do you suggest?" Danvar tossed the question back blandly.

"Depends what you're after." Rawson was just as bland. "Part of my function is to study you. I'll make you a present of the crop, so far. You return to your ship nights. Several smart people have tried to get aboard, or to find out about it in other ways. Negative there. Several misguided folk have tried to push gifts on you but you don't accept. You evade loaded questions, and you don't ask any. You show polite interest but pass no comment, on anything. That's about it. Now"—he sat back— "that's not the way we expect tourists to act, quite. No pictures, souvenirs?"

Danvar smiled and touched the insignia pin on his chest. "All my people on those ships up there can see and hear you through this, if they wish. And we have records. As for gift, we know your use of the word, but we have no equivalent concept. To us it is exchange."

"So? There must be a thousand things you could give us in return."

"No doubt. But this, your planet, is a closed community. Do you know anything of ecological balance? It can be very delicate. We are upsetting it just by being here, but we can control that fairly well. If we exchanged items with you, however, the effects would be much different. Unpredictable at this

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stage. All we wish to do is observe and understand, not interfere."

Rawson reported the gist of the talk to McDaniel for evaluation, later. "Damned right they interfere just by being here." Wainwright snorted, coming over to study the read-out and add his own interpretations. "The word-shift, for instance. Aliens, to start with, and 'fear' overtones. Then it slid into spacemen, and awe. Now it's shifting again, into Star-people, and something very like worship. Already we are being flooded with imperious requests to invite the guests, from all over—Europe, Asia, India, Australia, the Soviets, and China. Talk about a pendulum-swing!"

But the pendulum-swing analogy began to fail after a few weeks had gone by. More ships came down. Small parties of visitors were made welcome all over the world, and everywhere they went diligent observers went with them, and reported back to Rawson's headquarters. And, little by little, the progress-charts began to develop a skew. Rawson saw it just as fast as any of his staff, and had his own ideas on it, but waited for one of them to make the first comment. As always, the interpretation was the difficult part. But other parties were also able to detect the skew, if in different terms. He was called to yet another council, of a different texture this time, but with the same overtones of anxious urgency. These were businessmen and financial giants, representing the real power-blocs of the world.

"The situation has moved," he was told, "from the silly to the dangerous. We are up against discontent from all angles. Medicine, for instance, is now a dirty word. The Star-people are too obviously one hundred percent fit and healthy, and people want to know why the hell *they* can't be like that? Or, if you like, the rag-trade. It's a shambles! Automobiles don't sell, because everybody wants a super-chrome finish, an uncluttered line, and *that* kind of power-unit. And we can't deliver. Air lines are so far in the red they are never going to get back. Space research is dormant!" Other querulous voices took up the dirge. Rawson waited them out grimly.

"No," he told the last questioner, "I do *not* know anything you don't. All our information has been released, as agreed. But I do have patterns of reaction. As I see it the poison goes deeper than you think. Our multi-level culture system is gathering a king-sized neurosis, an inferiority."

"They are superior to us, all right," someone growled. "We didn't need you to tell us that."

"But they haven't pushed it. They have been scrupulously careful not to get involved at any time. Think it over. Over a hundred of them have been down now, have

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traveled all over the place and seen all sorts of things, and not once has any one of them slipped by as much as a fraction from the razor-edge of polite amiability."

"That's the hell of it," somebody else snarled. "They never do a thing you can lay a finger on. They're so indifferent!"

"It's not that," Rawson corrected. "Listen, try to understand just what is happening here, because I doubt if they want it any more than we do. They took time to study us beforehand, and ever since the first show they have been deliberately behaving the way we know we *ought* to behave—but can't quite manage it. Idealized normality, if you like. But you can't blame *them*. The fault is in us. Not that it helps any."

He went back to his office in a sour mood, unable to make up his mind whether the aliens had planned this or not. "When in Rome," he mused, "don't do what the Romans ought to do—not unless you want trouble, fast!" McDaniel was waiting for him with the current chart, and a grim scowl.

"It's about time we did something about this, Colby. Don't ask me what, but something. Look here!" Rawson looked, and whistled. He had himself annexed the term "tilt" for an unbalanced relationship, but these were hardly tilts. They were almost vertical.

"With us at the bottom," he muttered. "And this is the extrap?"

"Right. It would be easy to say have the celestial visitors pack up and blow—but look at the backlash figures, if they did. We're in a mess."

"And then some!" Rawson shifted his gaze to a separate curve down in the lower right corner. "This one? Oh, the Olympics!"

"That's hardly worth computing. Nobody gives a damn any more, and who can blame them? Who wants to play silly games while the superior Star-people stand by and watch? Performing animals! Colby what are we going to do? I have never seen anything like this. They just don't relate to us at all, not any more!"

Rawson sighed and was about to point out that I.X.C. was not in business to *do*, but to observe and advise, when his visiphone bleated. He shoved the "accept" and watched Danvar's face grow on the screen, unusually grave.

"Rawson. You are well?"

"As can be expected. Something I can do for you?" The phrase was just routine, but this time Danvar caught it up.

"Yes. If you will. Advice, please. Of our number, many have been much interested in your various forms of athletic and gymnastic activities. We place great value on health and well-being."

"Obviously," Rawson retorted, and Danvar raised a brow.

"Is it? No matter. From a group in China I learn there is to be a

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major contest involving athletes from all parts of the planet."

"Right. The Olympic Games. A regular once-every-four-years event, due in October this year. If you stay that long—"

"It is not just to watch. We understand the contest is open to all people. Even to us? Would we be allowed to compete?"

Rawson took a deep breath, let it out again, and managed to say with reasonable calm. "I don't know, offhand, how the rules apply. The only bar I can think of has to do with amateur status. I believe I can quote that, as I had occasion to look it up on the Peking argument. The relevant bits, anyway. Amateur: One who participates, and always has, solely for pleasure and for the physical, mental or social benefits derived therefrom, without any other material gain. That about covers it." He struggled for coherent thought and got no help at all from McDaniel's face. He could *see* the wheels spinning, there. "I'd have to refer it back to the authorities. Can I call you back? Where?"

"I am speaking from Novosibirsk, just now. Most interesting. A whole city devoted to physical science and technology."

"Yes, I can imagine. Danvar, there are a whole flock of rules involved in our kind of games. And regulations about diet. Drug assists, that kind of thing. And strict physical examinations. You'd have to qualify."

"That is understood, of course. I will await your call."

Rawson shut off the call and sagged, feeling the sweat break out on his face. McDaniel shook his head as if he'd been blackjacked. "Don't ask me," he pleaded, "what this will do to the charts. I don't know. This is one for the machine. It changes the whole strategic situation."

"Get on it, while I dig up the leading lights of the Games Committee and toss it in their laps. Dave, if the C.I.O. goes along with it, the aliens are about to relate—but good!" And it wasn't until he'd had time to think that it occurred to him to see this outrageous request as singularly apt. As if the aliens themselves were just as worried as he had been, and were staking everything on one throw. But for what? He worried at that all through two hard days of heated argument among the members of the C.I.O. When they finally agreed to let the Star-people enter a team, provided they could qualify and pass all the examinations, he took that datum back to McDaniel and demanded a general verdict from the machine. And the computer-wizard sneered and offered him the program-console.

"Let's see you write it. Go on, invent a whole new series of factors to cover this, if you can. Colby, we just don't have that kind of figures! Nor ever will have. Man, people have been trying to predict the re-

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sults of this kind of contest ever since there have been people!"

"I don't want to know who's going to win, Dave. I want to know what this involvement is going to do to the whole picture, and I would give an arm to know why the aliens have suddenly decided to *get* involved."

"The crystal-ball switch is seized up. All I know is that the picture will change. Just how will depend on the data as it comes in, as soon as the news breaks. Look, you invented this calculus. You should know how impossible it is to extrapolate from so many different variables. Wouldn't you be better employed reporting to Danvar and sizing up his reactions?"

Rawson took the hint, left McDaniel to his work and went up to his own office, where Jo Everard raised Novosibirsk for him. Danvar was pleased.

"It is good. You must let me know full details of what we have to do to qualify."

"I'm having a special copy of the rules made out to send on. You do realize you'll be competing with something like six thousand men and women—Earth's finest?"

"We can only do our best, my friend."

"And your team will have to reside in the Olympic Village for the period immediately prior to the actual Games. On that, do you want to specify any particular style of accommodation, or training facilities?"

"It will have to be discussed. Perhaps your authorities will permit us to assist with the accommodation? I shall be going at once to Peking. If you could inform the people there?"

"I'll do better," Rawson decided, there and then. "I'll be there myself and sort it out. I'll see you."

The Peking office of I.X.C. was in the southeast quadrant of the old Inner City, not far from the one-time Forbidden City section, now much re-built and modernized. His on-the-spot man. Yang How greeted him and explained how he had taken over the whole of one of the old legation buildings in the face of severe competition, as soon as the news had come through that the aliens might be entering for the Games.

"I'm glad you are here, Mr. Rawson. Already we are being rushed with inquiries from medical people asking to be allowed to examine the Star-folk, to serve as doctors, anything to get a closer look at them."

"That's only a start," Rawson warned him. "There'll be other things. Better warn the organizers to be watchful for sneak-thievery and illicit entry, too. And they had better tighten up their safeguards on the *other* competing nations." Jo Everard, who had come with him simply because he couldn't see how he could get along without her, demanded clarification on that.

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"What's to steal, from them? And why have we to be suspicious of the other athletes, all at once?"

"Athletes," he told her, "even alien athletes, need equipment. Up to now we've seen nothing more than they stood up in, and there are those who would stop at nothing to get something concrete, if it's no more than an old running shoe, or a sweat rag, that actually belongs to them. As for Earth's teams, what would you care to bet that all over the world scientists of all colors are suddenly taking a great interest in track-and-field, trying to be good enough to qualify? Can you think of a better way to get real close to someone than by running, jumping and training with him?"

The days and weeks became hectic for everyone concerned. Any slight hopes Rawson might have had of seeing Peking and observing the Chinese reactions for himself died a silent death. The demands on his time were ceaseless. He had McDaniel on visio regularly, checking the chart swings. And they *were* swings, dramatically altering the profiles. Now, for the first time, Earth people could see the aliens as persons, and argue about them, even bet on the outcome. He should have been intrigued and pleased, but he knew that he was seeing a switch from his kind of reaction-relationships into another and much older kind, one that he had no math for. Rivalry and competition, that wordless urge to beat the other guy that throws a bias into any calculation.

And then Danvar wanted his advice and guidance on cooperating with the Athlete Village extension. Although they used modern portable power tools and materials like flexiglass and feather-light aluminum alloys, the Chinese still had one Oriental characteristic, that of employing swarms of people all on the trot, but the appearance of Rawson and Danvar, along with two more of the Star-people, brought the trot to a respectful and staring halt.

"It is a compact design," Danvar commented. "The groupings are called?"

"I don't know. Pavilions and dormitories, I guess. Each nation has a section to itself but there's no ban on sharing the facilities. The living quarters are minimal, of course, to save space."

"Also on a ship," Danvar smiled. "We are familiar with close-packing. Is it possible to extend?" He looked up at the thick walls of the city's zoological institute, which bounded this part of the Village. Yang How made the appropriate inquiries and came back with an apologetic shrug.

"It would be permitted to extend, that way, along by the road. But it has not been planned and it might take some time to arrange extra materials—"

"We can supply," Danvar interrupted gently. "Accommodation

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for fifty, similar to these? You approve?" That request started a chatter and much arm-waving and argument. Rawson watched, studying signs and wondering where the notion came from that Orientals were impassive? At last Yang How was able to nod and grin.

"It is approved. There will be many men willing to help, when you get the stuff here."

"That won't be necessary," Danvar told him, and then lowered his head and murmured something in a strange tongue. Rawson had a sudden intuition. He grabbed Yang by the elbow, drew him aside.

"You have a radio-phone? Use it. Call the office. Get telecameras here fast. Right here, fast as you can!"

At that, the cameramen were only just in time to see the familiar shape of an alien ship slide down out of the blue and settle to a rock-steady halt some twenty feet above the ground at the site of the approved extension. A dark square opened in the underside and as Danvar and his two companions went forward the familiar silver cables began to descend, two of them, with a girl clinging to each. They touched down, moved apart, Danvar's two companions ran in to help, and down came a massive roll of silver stuff. Rawson stared as he saw them peel off an edge and begin to unroll it, saw massive packages of metal sheets come down, to be split apart and handled, stuck together with the aid of what looked like an aerosol-squirt, and, so fast that he didn't see quite how, there was a row of cubicles. And then another. The Chinese workmen were inching closer now, staring intently, itching to help.

"You've done this before," Rawson mumbled, and felt foolish as Danvar smiled and nodded.

"Many times. It needed only a slight modification in the design to be similar to yours. It will not take long. Shall we go along and look at the stadium itself, where the performance is to take place?"

Rawson had no objection. He wanted to study Danvar, all at once. There was a new intensity, a new feel about this inscrutable man, as if this game-playing was the most important thing that had happened so far. The signs were not obvious, but there just the same for one who knew how to look. Later, in his office once more and with Danvar agreeably accepting a cup of coffee, the I.X.C. man could hold himself no longer.

"You know our phrase 'off the record,' I think?" he asked, and as the alien nodded. "I wish you'd take my word for it now, and then tell me—just what are you after? What do you want with us?"

"You are a fascinating people," Danvar replied. "Isn't that enough? It is appropriate, in a way, that you should ask me this, just here. You know, of course, that we are on the

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site of what is almost certainly the oldest city-culture on your planet? There was a city here some three thousand of your years ago, at least! Probably earlier than that!"

"You're not interested in ancient history."

"No, not in that sense. We are interested because you are so *close* to your origin, because it is so recent that the signs are still visible."

"You mean we're primitive, don't you?"

"Not that, either." Danvar was suddenly serious, "Like this. Some half a million years ago on this planet the great battle was being worked out between various competing forms of hominid. I have visited many planetary systems, my friend, and almost always, in the struggle for survival, it has been the hominid form in the ascendant. But then comes a stable plateau of development and refinement, of exploiting the almost limitless possibilities. It is a slow, rich business, this unfolding, for those who like it. For others, like myself, it is tedium. Think of this, Rawson. Half a million of your years ago my family line was already ancient. Our origins are so distant we know of them only as large patterns in an intellectual scheme. But here . . . here it is all happening!"

"What you mean is, this is the end of the line," Rawson plucked that thought from the rest. "Human is as far as we go. There's nothing higher?"

Danvar grinned, and Rawson felt closer to him in that moment than ever before. "There may well be higher forms of life, my friend, but we are not aware of them. Should we be? You have advanced simians, here. Are they aware of you? Do they try to make contact, to talk to you?"

"You have a point," Rawson admitted. "We are hardly at the stage of being able to talk to each other, yet!"

That conversation marked the beginning of a closer understanding between the two men, but as the weeks went by and Games tension mounted, Rawson felt sure there was more, that Danvar had told him only a part of the truth. But he was kept far too busy to give time to philosophical chimeras. The eyes of the world were on Peking, and the Chinese people rose manfully to the occasion, coping with ten times as many visitors as their most optimistic schemes had anticipated, getting at first hand a taste of capitalistic wealth and diversity that finished forever the last splinters of the Bamboo curtain. But those avid eyes were also on the aliens, now more than ever before, and Rawson's people were kept hopping to report the fitful swings and shifts in attitudes.

For one thing, the aliens offered no entries at all for boxing, or any kind of wrestling, or anything at all that involved combat. The argu-

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ments and reactions to that were fierce, often violent, among proponents of various schools of thought. There were also innumerable wiseacres ready and willing to draw deductions from their trial performances. The aliens managed to field some fifty contenders in all, just managing to qualify in track events, but doing very well indeed in gymnastics, in sheer strength events like shot put and discus, and almost failing to qualify at all in swimming. Rawson himself O.K.'d the release on that, the explanation being that they just were not used to swimming with clothes on, couldn't see the point in it. It was their second, and positive, comment on Earth mores, and it stirred up a storm.

And they had gadgets. As Danvar explained for Rawson's benefit. "We need devices to help us maintain health within the close confines of a ship over long periods of inactivity." Some were simple and obvious. One or two were not so. There was, for instance, a kind of tracksuit of dark and clinging plastic stuff that molded itself to the body and offered steady and stepless resistance to any kind of movement, the harder the effort the greater the resistance. And there was a portable treadmill, a box with a mobile floor and a harness, and as you ran—in the same place—concealed projectors threw the convincing illusion of bright scenery slipping past. As word of that one got out, there was trouble. Rawson was in the Village when it broke, in the U.S. sector. He came in on a scuffle between two tracksuited athletes and a red-faced group of men struggling with cameras and instruments to get into one of the boxes.

"Hold it!" he barked, the edge on his voice bringing paralysis to the melee. "What goes on?" He pinned one of the athletes with a hard eye. "You're Joe Lomax, aren't you? What are you doing with that?"

"I borrowed it." Lomax sounded aggrieved. "I got talking to one of the Star-girls, her name's Wenta and she's running. I'm admiring the dingus—I tell her I'd like to try it, see? And she asks me would I care to borrow one like it? What do you think? But now look, these guys come snooping and want to take it apart!"

The men with the instruments shuffled and left it to one of their number to snarl, at last. "We only want to see how it works!"

Rawson wasted no words. He saw Yang How shoving through the crowd and signaled to him. "Get these characters out of here, and tighten up on the security, can't you?" Then he returned to Lomax. "You say you asked, and she agreed on a loan? Can I have her word on that?"

"Sure! She's about . . . over there! Hey, Wenta!"

Rawson watched her come through the crowd. She was about five-seven, as beautifully made as any Greek marble, her one-piece

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cream leotard as snug as a second skin, her bronze-red hair held back by a single white ribbon.

"You wish to speak to me?" Her eyes were green, and cool.

"Yes. A question. You people don't give, or accept gifts, right? But you lend?"

"Why not?" she shrugged. "It will be returned. We share anything that helps well-being. There is something wrong with that?"

"No. Not at all. Has anyone else borrowed equipment from you?" He cast a glance round the interested faces. "Anybody?"

There were several nods and murmurs, than all heads turned as a burly thick-shouldered man came roaring out of a cubicle in the across-the-street Canadian sector.

"My twister!" he yelled. "Some illegitimately begotten person has hooked my twister!"

Rawson looked his bewilderment and a nearby husky grinned.

"One of these, look!" He hoisted what looked to be no more than a gray plastic tube, wrist-thick, about three feet long, with a hand-grip at either end. "A real neat gadget, this. A whole gymnasium in one. Watch . . . it's a stepless resistance this way"—he gripped and pressed his hands together, and the rod thickened as his shoulders strained—"or this way"—and he reversed his effort, pulling apart,—"or you can try to bend it, or twist it. Or put one foot in a handle and lift with your hand, or both hands—"

"Let me see it!" Rawson took the device. It was light. It seemed to be all in one piece. He could understand someone being curious about it, but there was something else more urgent.

"Quiet a minute!" he raised his voice. "You're all athletes. If you want to borrow, to share equipment with our friends from space, that's all right, because you'll *use* it. And *return* it. But it looks as if there are other people who will want to steal these things, and take them apart—and you won't get them back. I'll do what I can to strengthen security, right now, but it will take time. You can help, all of you. You know each other. You know what's at stake here. Pass the word. Spread out. Watch for anybody who doesn't belong, and grab him—and report to anybody with this badge!" He thumbed his I.X.C. lapel pin. "Right?"

Yang How and a couple of Chinese security guards brought the miscreant to his office about an hour later They'd caught him trying to climb the wall into the zoo. And he was no scientist, but a professional crook lured by the offer of a large reward for acquiring something—anything—alien. Rawson wasted no time in making contact with a certain world-famous physicist who had become unofficial spokesman in the frequent and irascible meetings between I.X.C. and various scientific enthusiasts.

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"I respect your discipline," he said bluntly. "You had better respect mine. I'll lay it on the line for you. Right now the aliens are popular, more popular than they have ever been. On the other hand, science with a capital 'S' never has been, and you know it. So watch it. One more gaffe like this and I'll break the news that science is interfering, trying underhand tricks on our Star-friends. And you know where that will put you!"

There were no more incidents. But there was ever-growing tension and with the actual ceremonial opening of the Games, virtually all work that could stop, all over the world, did. All eyes focused on the great stadium, either from the packed stands, or by virtue of satellite-borne electronic reports. The Chinese had done well. Even the weather cooperated as almost seven thousand picked men and women from one hundred four nations—and the stars—paraded on to the mighty field. Peng Lu-Ching, Chairman of the People's Republic of China, flanked by gold-braided dignitaries, had been escorted to his box and hailed with his national anthem. And now they came, shields and national flags, uniforms, and contestants, the Greek contingent traditionally first, and then the Star-people, and then the rest. It felt like that, Rawson mused, sensing the tension and the breathless admiration for that small band of valiant aliens. He and Danvar, with half a dozen other Star-people, had seats just below the Presidential box. He wondered if they felt it too, that assumption that it was all Earth on one side, and the aliens on the other?

It grew, that feeling, as the various events were run off. It grew from a thought into open recognition, into a breathless speculation and wonder as the spectators everywhere began "counting the golds." Men running, one hundred, two hundred, four hundred, eight hundred meters, and the golds fell to the U.S., to New Zealand, to a running genius from Kenya, and the aliens collected one bronze. Women running, and Lomax's friend Wenta set hearts fluttering when she stormed into a clear win in the one hundred meters. One gold. Another in the eighty-meter hurdles to a black-haired flash of grace called Melvi, made two. The Watusi, fielding a full team for the first time, swept the high and broad-jumping scene away from everybody, but the men's shot put went to alien Alvarn, and the women's shot put to a redhead, Setta, and the tension began to hurt. It screwed tighter as Setta went on to out throw a mighty Russian in the discus. Then the hammer throw went to the host nation, China, amid huge delight from the crowd, who would watch their local heroes and heroines go on to take both javelin events.

Rawson found himself counting

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as anxiously as anyone else. The aliens made no gains at all in the swimming events, and everyone knew why, but they compensated in part by sweeping the board in diving, male and female. Even Rawson, who had but the vaguest grasp of the technical side, had to admit that he had never seen anything so obviously superb as those perfectly controlled turns and somersaults. But he found time to watch Danvar, nevertheless, and he saw signs of strain as the days wore on and the totals began to mount. At any other time the competition would have been hot between the U.S. and the U.S.S.R. and the Chinese were by no means lagging—but this was no ordinary time. Everything else was forgotten in the unspoken but crucial match taking place. With two days to go, the alien male team made a dramatic sweep and took every event in the gymnastics, floor, horse, rings, bars and team, so many points ahead of the nearest competition that there could be no argument at all, especially from the defeated Japanese, who had been strong favorites. And then, with only one day to go, the alien ladies duplicated that effort with a display of skill and grace that brought standing ovations from everyone except Danvar.

And Rawson was baffled. He checked with McDaniel by visiphone. The progress chart was beautiful, the profiles almost perfectly horizontal. It was the kind of total relationship any mediator would dream of. And yet Danvar was sweating—literally—on the last climactic day. Rawson had never seen him so visibly distressed before, and it was by no means due to the high temperature. Keeping tactfully silent and studying his card, Rawson saw that there were only three more events in which the aliens were entered, and with the best will in the world, the rest was just trimmings. One event, the marathon, had already started, but the contenders were now miles away, trotting doggedly along the winding road north of the city to complete the staggering distance of twenty-seven-and-a-bit miles before returning to the stadium.

But the scores were still coming in. Alvarn, the mighty, managed to nose out the opposition to win the decathlon. Setta the redhead matched him on the women's side with the pentathlon. Rawson did some fast totting up, along with scores of thousands of others, and rechecked just to be sure. And it was. The aliens were just one behind—just one.

Rawson made the addition just once more, to be certain. No, they couldn't win. At the most, they could draw even, and then it would be a matter of counting silvers and bronzes—and then he dismissed that as a sea-surf murmur began to sweep through the packed throng. He snatched a glance at his watch

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again. Almost two hours. The runners must be nearing home now. He scanned his card. The Masai had been fancied for this event, on the form they had shown in the long-distance walking, but something about jog-trotting against pressure had thrown their best men, and they were not entered. "Expert" opinion hovered between Valery Chenchik, of the U.S.S.R, and Arne Pedersen of Sweden.

And one alien, a valiant runner, one Karn, who had already taken a gold in the ten thousand meters with a fantastic sprint in the last lap. And just about killed himself doing it, Rawson recalled. A rumor swept the crowd, grew into a gasping roar as they all stood and stared at the black-shadow opening that led on to the track. Ten minutes under the two hours, and here they came now. Rawson ached in sympathy, harking back to his youth and the experience of senseless rubber knees, binding chest, and breath that scorched like hot acid down a raw throat as one reeled on, and on. Twenty-seven miles in less than two hours was a killing pace. Pedersen showed first, tramping like a dying machine, visibly weaving, stumbling, literally falling forward with his legs pumping to keep up. Three yards after him came Chenchik, a lean and wiry wolf of a man, stooping now and unable to keep his arms up, but going forward relentlessly at little better than a fast walk. Then, incredibly, came Karn, and the crowd groaned in instant sympathy as the alien staggered into sight, his head high like a drunken man, his hands blindly paddling the warm air, and his legs visibly on the point of buckling at every labored step.

The groan broke and modulated into a many-throated cry of encouragement, and the cry, incredibly, was "Karn! Karn! Come on, Karn!" Rawson stood and shouted along with the rest, wanting the man to go on. Pedersen stumbled, went down on a knee, hung there a moment. Chenchik managed to weave past him and reel on. The Swede fought his way up and shambled forward. The crowd began to chant for Karn in regular rhythm and the alien kept going, drunkenly, doggedly, impossibly, some seven yards behind the two struggling against each other round the final bend. They were shoulder to shoulder now and a strong breeze would have flattened either of them. Pedersen stumbled again, down on hands and knees. Chenchik staggered on, officials hovering by the tape to catch him. He made it, and collapsed into strong arms. Pedersen got up and reeled on. And made it.

And now the chant was insistent for Karn, urging him step by step until he tottered across the line and sagged into a panting heap in the arms of two hefty Australians. Rawson sank back into his seat, suddenly almost as exhausted as the

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three heroes out there. And then he saw that Danvar was gasping too, but, unless all the signs were crazy, the alien was relieved. Relieved?

"You wanted him to lose?"

"We had to lose, friend Rawson. That was imperative."

"That does it!" Rawson gripped his arm and inclined his head. "Come on, I can do with something long and cool, and so can you. And I want to know!"

Danvar gripped the tall misted glass, sipped from it, and smiled. There was enough pandemonium going on to make their talk quite confidential. "We *had* to lose," he repeated. "To make a good show, but go down to honorable defeat."

"You planned it?"

"Not as finely as it happened, but yes, it was planned. We have studied you enough to know that you had to beat us at something to adjust the balance of relationships, to make it possible to trade without suspicion."

"Trade?" Rawson breathed. "Is that what you've been after all the time? To trade?"

"First, we had to understand you; then you had to understand us, to feel that we are just people—like you."

"I see!" Rawson shook his head as he realized just how exquisitely the whole business had been managed. Then came a doubt. "What in the world have we got that you could want? I can see our people falling over themselves to get stuff from you, but what have we got?"

"Much! This, for example." Danvar lifted his glass. "We have been astonished at your use of this fragile material."

"Glass? You mean to tell me you never discovered glass?"

"Possibly we did, long ago, and discarded it because of its fragile properties. We achieve transparency in other ways. True, you have modified glass in several ways, but you still use this delicate form. Then there are perfumes, art works—particularly music—handcrafts of many kinds that we have never known or have forgotten. As for our side, we have very little in fact that you do not already have in embryo. At most we can show you a few shortcuts."

"There's more," Rawson guessed. "I've learned how to listen to you. There's more. What?"

"I told you, you are much closer to your origin than we are. In us the essence tends to become diluted. We can do a great deal with eugenics, but we prefer the natural supply to furnish new combinations. And of course we can contribute in return." As Rawson groped for his meaning, Danvar nudged his arm and pointed to where Joe Lomax had entered the little saloon with his arm affectionately about Wenta's shoulders. "Like that," he said. "Genes! Now I think we must hurry for the closing ceremonial. I understand it is very impressive!" ■

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THE ALIEN ENEMY

Michael Karageorge

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They were a tough people,
and there wasn't one single thing they couldn't lick.
Nevertheless, the Enemy routed them . . .

Illustrated by Leo Summers

Winter darkness falls early on Rotterdam. When my flitter had parked, I walked to a parapet and saw light in star clusters, nebulae, comet tails, filling the spaces of the city. Windows were blinking out in the offices, where towers lifted row on row from the waterfront. But vehicles swarmed, signs danced, shops beckoned, the pavements made a luminous web as far inland as I could see—it appeared to flicker with the ground traffic that counted endless rosaries along it—and the harbor and canals interwove a softer sheen. I was too high to make out people through all that gloom and glow. They were melted into a mere humanity, and their voices came to me as the distant surf of machines.

Up here was less illumination, just some tubes around the lanes and walkways, a fluorescent door to the elevator head, and whatever spilled down from the beacon. So although the air was raw and damp in my nostrils, forcing hands into tunic pockets, I could look past the electric star which marks this building, out to a few of the real stars. Orion was aloft and the Charles Wain stood on its head over the Pole. I shivered and wished the Ministry of Extraterrestrial Affairs had picked some other place for a centrum, an island further south where the constellations bloom after dark like flowers.

But even the Gearchy has to make compromises. The desirable places on Earth filled up long ago, and then the less desirable, and then the undesirable, until the only clear horizons left are on the mountain roofs, the icecaps, the stone-and-sand deserts, whatever is still worse to make a living from than the bottom of a megalopolis. The bureaucrats I work for did not do so badly; the Low Countries complex has much to recommend it. They control a lot of wealth and are correspondingly influential.

Anyway, I don't have to live in

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Rotterdam, except a few days at a time, reporting in or getting briefed. Otherwise I mostly spend my furloughs at one or another resort, as expensive and exclusive as possible. Spaceman's pay accumulates wonderfully on the long hauls, years or decades in a stretch. I can afford whatever I want on Earth: even clean air, trees, a brook to drink from, a deer to glimpse, unlighted nights when I take a girl out and show her the stars I have visited.

Let me see, I thought, *once this is over with here, where should I go? Hitherto I've avoided places where Cumae is visible. But why, really? Hm-m-m . . . catalogued HR 6806, 33.25 light-years distant, K2 dwarf of luminosity 0.62 Sol . . . yes, I'll want a small telescope as well as some large brags for the girl . . .*

One star detached itself and whirred toward me. Startled, I realized that this must be Tom Brenner coming. Suddenly I was in no more mood to boast about what I had done at Cumae than I was on first returning. I didn't want to confront him, especially alone. If I hurried, I could be inside before he set down. I could await him together with d'Indre, impregnable in the apparatus of government.

But no. I had seen too much—we had both seen too much, he and I, and all those men and women and children for whom he must speak tonight—on the high plains of his planet. In our very separate ways, we had both known the terror of the alien enemy that brought death, ruin, and the end of hope. I could never be totally an official to him. So I stayed by the parapet, waiting. The breath came out of me like smoke and the cold crept inward.

On Sibylla it was always hot. Cumae glowers half again as great in the sky of that world as Sol does on Earth, and pours down nearly twice the energy. Those wavelengths are poor in ultraviolet but rich in infrared. The sunlight is orange-tinted, not actually furnace color though it feels that way.

I asked Brenner why the colonists didn't move upward. Peaks shouldered above the horizon. Their snows were doubly bright against the purplish heaven, doubly beautiful against the gray-green bushland that stretched around us, murmurous and resinous under a dry wind. I saw that timberline, or whatever passed for it, reached almost to the tops. The dark, slightly iridescent hues suggested denser growth than here. Yonder must be a well-watered country, fertile in soil, and cool, cool.

"Not enough air," he said. He spoke English, with a faint American twang remaining after generations. They were chiefly Americans who went to Sibylla. "We're about as high on this massif as we can go."

"But . . . wait," I objected. "The pressure gradient should be less than on Earth. Your planet's

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got fifty percent more diameter, a third more surface gravity."

"And less air to start with." Brenner cleared his throat. I recognized the preliminary to a speech.

"We leave the lowlands be because they're too hot, not because of too thick an atmosphere," he said. "Remember, this is a metal-poor globe, lowish density in spite of its mass. So it didn't outgas as much as it might have, in the beginning. Also, on account of the slow rotation, it don't have any magnetic field worth mentioning. Cumae may not be the liveliest star in the universe, but it does spit plenty of protons and photons and stuff to thin out an atmosphere that hasn't got a magnetic field to hide behind. We get a pretty strong radiation background too, for the same reason; gives medical problems, and it'd be worse higher up. Furthermore, when you got an extra ought-point-three G on you, and manual labor to do, you need lots of oxygen. So the long and the short of it is, we can't colonize the real heights." He cocked his head at me. "Didn't they brief you ay-tall, son?"

I looked back at him, hard, feeling I rated more respect as the first officer of an exploratory ship. His leathery features crinkled in a slow grin. The President of Sibylla was no more formal than the rest of his ten thousand people.

He wore the usual archaic kilts, blouse, boots, sun helmet set rakishly on grizzled head, machete at hip. But my uniform was less neat than his garb, ten minutes after we had left the buggy by the roadside and started climbing. The gravity didn't bother me; we use rougher accelerations on a craft like the *Bering*. I was aware of my flesh and bones dragging downward, nothing worse. The heat, though, the booming and thrusting wind, the scanted lungfuls I breathed, dryness afire in nose and throat, malignant grab of branches and slither of sandy soil, something faintly intoxicant about the plant odors, had entered me. I was sweat-drenched, dusty, a-gasp and a-tremble, and gladder than I should be of a chance to rest.

I decided not to stand on the dignity I didn't have. Besides, I thought, we were men together in the face of the not human. It had killed, it could kill again, it could smite Earth herself. I felt lonelier in that wide grim landscape than ever between the stars.

"They gave us what information was available," I said. "But it was simultaneously too ample—for one head to contain—and too little—for the totality of a world. Hard for us to guess what's significant and what's incidental. And you've been isolated from us for nearly two centuries. Nothing but a thread of laser contact, with a third of each century needed to cross the distance between. Our fleet took longer still, of course; the big ships aren't meant to go above one G, so they need a year to approach light speed and

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another year to decelerate. Inboard time at maximum tau factor isn't negligible either. We experienced several months in covering those parsecs. And we were wondering the whole way if we'd arrive to find the aliens had returned—arrive to find you dead here and a trap set for us. Under the circumstances, sir, we were bound to forget some of what we'd learned."

"Well, yes, I reckon you would at that," Brenner said. "Getting back to why we've settled this Devil's Meadows district, I can tell you we haven't got any better place, and most are not as good. Sibylla is not Earth and never will be."

"But you have colonized the polar regions, haven't you? The original exploration team suggested it, and my briefing said—"

"We abandoned them a spell back. They do have higher air pressure and lower background count, at a reasonable average temperature. But that's only an average. Don't you forget, the rotation period is locked to two-thirds of the year, we being so close to the sun. Sixty-five Earth-days of light are tolerable, though it gets too hot toward evening for us to work. We can grow crops, sort of, with lamps to help through the sixty-five-day night. But at the poles, a thirty-seven-degree axial tilt, the seasons are too flinkin' extreme. What with everything else they had going against them, our poor little terrestrial plants kept dying off there. We haven't the industry or the resources to practice greenhouse agriculture on the needful scale." Brenner shrugged. "Finally we gave up and everybody moved equatorward."

I glanced down the crater slope. The road from Jimstown was dirt, a track nearly lost to sight, rutted, overgrown in places, little used since the destruction of New Washington. But traffic had never been heavy along it; no community on Sibylla was ever more than an overgrown village, and most were less. Tiny at this remove stood Brenner's buggy. The lank horse sniffed discouragedly at the brush it could not eat.

We might have taken a flitter from one of the relief ships. But that would have meant waiting until it could be unloaded and fetched down from orbit. Besides, I had wanted some feel of what Sibylla and its people were really like.

I was getting it.

High hopes, two hundred years ago. People who were going to a new uncrowded unplundered world, a whole new world, and this time build things right. They understood there would be hardship, danger, strangeness, on a planet for which our kind of life is not really fitted. But there would be nothing that men had not encountered and overcome elsewhere. The explorers had made certain of that beforehand.

Economics was a stronger motive than decency for being sure. The Gearchy takes a bit of political

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pressure off itself with each colony it establishes, but does not really solve any physical problems at home; and the cost of sending the big ships is fantastic. The aim is to make Earth's people look up through the dust and smoke and say, "Well, at least somebody's doing all right out there, and maybe we'll be picked to go in the next emigration, if we stay in favor with the authorities meanwhile." Failures would be very, very upsetting. Only the news of outright attack had justified organizing the Colonial Fleet to evacuate the Sibyllans.

The investment in them was so huge. Their ancestors came with tools, machinery, chemicals, seeds, suspense-frozen animal embryos, scientific gear . . . the basics. Of course, they brought a full stock of technical references, too. As population expanded, they would build fusion-power stations, they would replace the native life forms in ever larger areas with terrene species, they would at last create Paradise. To judge from their laser reports, they had been following out the plan. It was going slowly because Sibylla was uncommonly hostile, but it was going.

Now—The reasons why they had not rebuilt were plain to see. The lean ships that appeared in the sky, sixty-eight years ago, bombing and flaming, had knocked the foundations out from under the colony. Too much plant was wrecked, too many lives were lost, too few resources were left. For a lifetime, the people could merely hang on, keep their economy stumbling along at a Seventeenth or Eighteenth Century level, cling to the hope that we would answer their appeal. And all the while they knew fear.

I looked again at Tom Brenner. Before he was born, the enemy aliens had destroyed from pole to pole. In days—Earth-days—their fleet had departed back into unknownness. At any instant they might return, and not be content with blowing his toy towns off the map. I wondered how deep the weariness went that I read upon him. Yet he stood straight, and he had a squinty-eyed grin, and two of his children had survived to adulthood and one grandchild was alive and healthy.

"Come on," I said in a harshened voice. "Let's get this finished."

We didn't stop till we mounted the rim and looked down into the fused black bowl where New Washington had been. A few skeletons of buildings jutted from the edges, but only a few, their frameworks grotesquely twisted. I estimated that the blast had released fifty megatons.

The star became a taxi. It glided to a halt across the deck from me and balanced while the stocky figure climbed out. I wondered how he paid it. They had told me the Sibyllans were interned on a military reservation while the Gearch and his cabinet decided what to do

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about them. Well, when d'Indre demanded a live conference with the old man, perhaps the colonel had taken pity and slipped him some plutons so he could arrive like a citizen, not a consignment.

The taxi took off. Brenner started toward the door. At home he had walked with a rolling, ursine gait. Here he flowstepped, light and easy as an Earthdweller on Mars. His cloak flapped loose, his singlet was open on the broad hairy chest. The unaccustomed cold didn't seem to bother him, rather he savored it.

I moved to intercept him. "Good evening," I said.

Shadows barred our faces. He leaned forward to peer at me. The cigar dropped from his jaws. "Holy hopping Judas—Nick Simic!" He shook his head in bewilderment. "But you, your ship, you stayed behind."

"Your settlement was out of touch with astronautics," I said. My tone was sharper than intended; I really wanted to gentle the shock for him. "The Colonial Fleet accelerates at one G. But in an exploratory vessel like the *Bering*, we're selected professionals; and the motors have a lot less mass to act on. We load ourselves with gravanol and crank her up as high as ten Gs. In five or six weeks we're close to light speed and can ease off. I've been home for a year."

"You, uh, didn't stay long on Sibylla, then."

"Long enough."

"Well." He straightened. The remembered chuckle sounded in his throat. "Quite a surprise, son, quite a surprise. But pleasant." He thrust out his hand. I took it. His clasp was firm. "And how are your shipmates?"

"Quite well, thank you, the last I saw. The *Bering* has left again. Further study of the Delta Eridani System. The third planet looks promising, but its ecology is peculiar and—" I realized I was chattering to avoid speaking truth. "I stayed," I said, "since I was in charge of our investigation on the ground and drafted our report. Citizen d'Indre wanted me for a consultant when you arrived."

"I'm sorry if you missed going on account of us."

"No matter. I'm in line for a command of my own." That was true, but I said it merely to cheer him. "How are your people doing?"

"O.K. to date." Brenner didn't seem in need of consolation, now that he had gotten over his surprise. I don't suppose anyone grew old on Sibylla who couldn't land on his feet when the floor caved in. He drew a breath and gave me that straight-in-the-eye look which he had once described as Horsetrader's Honest Expression Number Three. "'Course," he said, "we wonder a wee bit why we're held incommunicado and till when."

"That has to be decided," I said. "What happens tonight could be pivotal."

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"Don't the proles know we're here?"

"Nothing except rumors. Your story has to be handled like fulminate. You can't imagine how restless those billions there are." My hand swept an arc around the city. It growled and grumbled. "The original news, nonhuman vessels attacking Sibylla, was let out with infinite care, and only because it couldn't be suppressed. Considering that they seemed to have faster-than-light travel, and something like gravity control, the way you told it, the photographs you transmitted—Panic can bring riot, insurrection." I paused. "So can rage."

"Yeh." The lines deepened around Brenner's mouth, but somehow he kept his tone easy. "Well, what say we get on with it? Oh, almost forgot." He stooped to pick up the cigar. "Soldier gave me some o' these. Friendly taste. No tobacco on our planet, you recall. We'd everything we could do to raise enough food to keep alive."

My gullet tightened. "Put that thing away!" I exclaimed. "Over the side with it! Don't you understand who we're about to see? Jules d'Indre, Minister of Extraterrestrial Affairs. What he recommends be done about you, the Gearch is almost sure to decree. I warn you, be careful!"

He regarded me a while before he obeyed. His next words were astonishing. "Did that girl who traveled with you, Laurie MacIver, ship out in the *Bering?*"

"Yes. Why do you ask?"

"Too bad." He spoke softly, and for a moment laid his hand on my shoulder. "I think you want to help us, son, according to your lights. But she had something extra. You know the word 'simpatico'?"

I nodded. "She is that," I agreed.

We went ranging about, she and I, after a ground-effect car had been brought down and assembled. My thought was to interview as many Sibyllans as possible before they left. None were alive who had experienced the attack, but older ones might recollect what the generation before them had said, and might have noticed significant things in the bombed-out towns before salvage and erosion blurred the clues. Laurie accompanied me for several reasons. We didn't need a computer officer here, and you don't travel alone on another planet. But primarily, she understood people, she listened, and they talked freely because they sensed that she cared.

It is not true what the alley dwellers snigger, that spacewomen are nothing but a convenience for spacemen. They hold down responsible posts. And in the black ocean between stars, among the deaths that lair on every new world, on return to an Earth grown strange, you need someone very special.

Just the same, we had thin luck. Sunset handicapped us. Cumae hung low and went lower, casting an inflamed light that was hard to see by

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across the plateaus. But the air had cooled sufficiently for outdoor work, and everyone on those pitiful farms toiled till he dropped in his tracks. They must complete their daylight jobs—disking and sowing at the present season, plus hay harvest, livestock roundup, and I don't know what else—largely with muscle power. They could only illuminate a limited part of their holdings after the moonless dark came upon them, truck gardens and such that would fail otherwise. Metal and manpower were too scarce to produce the factories which could have produced the machines and energy sources they lacked.

To be sure, this was the last round for them. They were going to Earth. But you can't spaceload ten thousand human beings overnight. The Fleet was barely able to carry the rations they would need on their journey. They must feed themselves meanwhile, and they had no reserves. I was appalled at the wretched yields, the scrawny animals, the stunted timber. And, while most of the individuals I saw were whipcord tough, they were undersized, they had few living children, the graveyards were broad and filled.

"Terrene life is so marginal here," Laurie said as we drove. Her voice was muted with compassion. We had no logical need for a recital of the facts. We had known them since before we left Earth, when we studied the reports of communications from Sibylla. But those were words. Here she met the reality. She needed to put it back into words for herself, before she could reach beyond the anguish and think about practical ways to help.

"Not simply that the native species are poisonous to us," she said. "They poison the soil for our crops. You have to keep weeds, bacteria, everything out of a field for years before the rain's leached it to the point where you can begin building a useful ecology. And then it's apt to be attacked by something—new poisons seeping in, diseases, stormwinds —and at best, it never gets strongly established."

I nodded and listed the causes, to hold off the idea of a personally evil cosmos. "Long nights, weird seasons, shortage of several trace elements, ultraviolet poverty coupled with X-ray and particle irradiation, gravity tending to throw terrene fluid balances out of kilter, even the geological instability. Some of their best mines collapsed in earthquakes in the early days,—and never could be reopened. Oh, yes, it's a hard world for humans."

My fist struck the control panel and I said with a barren anger: "But so are others. There's nothing wrong here that men haven't found, and beaten, elsewhere. The wildlife is worse on Zion, the weight is heavier on Atlas, a full-fledged ice age is under way on Asgard, Lucifer is hotter and has a higher background count—"

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She turned in her seat to face me. Sundown light, streaming through the turret, changed her gold hair to copper against purple shadows. "But none of those were attacked," she said.

"Not yet," I said. "At least, as far as we know."

We should not have mentioned it. The thought had haunted us since we returned from our last voyage and got the news. It dwelt in the back of every mind on Earth. Perhaps it had done so since man first ventured beyond the Solar System. Our few score parsecs of exploring are no trail whatsoever into that wilderness which is the galaxy. Who can doubt that others prowl it, with longer legs and sharper fangs?

Why had they struck? How? Where else? *Who's next?*

The Sibyllans did their best to answer Laurie's questions and mine. But not only were they hard-pressed for time and dull-witted with exhaustion, their information was scant. I had now inspected the ruins, some photographs of ships in flight, eyewitness accounts, compiled histories. The basic narrative was in my brain.

The raiders could not hit everywhere at once. Josiah Brenner, Tom's father, President in his day, got most population centers evacuated before they went up in fireballs. A majority already lived on isolated farms, it took so many hectares to support one person. For the same reason, the former townsfolk scattered across the whole habitable planet afterward.

The result was that hardly anyone today knew anything that I did not. In fact, my picture of the catastrophe was clearer than most. The ordinary Sibyllan had neither time nor energy for studying the past. The educational level had plummeted; children generally left school to work before they were twelve Earth-years old. Folklore took the place of books.

The books themselves were vague. No real census or scholarship was possible. "Casualties were heavy," said the chroniclers, and told many tales of suffering and heroism. But the figures they gave were obvious guesswork, often contradicting someone else's. I believed I could make a better estimate myself on the basis of one fact. The Sibyllan population which the original colonizing scheme had projected for this decade was some two hundred thousand. The actual population was a twentieth of that.

After a while, Laurie and I quit. We could do more good back in Jimstown, helping prepare for the exodus. With facilities as primitive as they were here, that was going to be a harrowing job. Our crew would stay after the Fleet left and search for further clues. Besides, I didn't fancy traveling after dark.

We had to, though. Passing near a scarp, our car was struck by a boulder when the crust shivered and

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started a landslide. The damage took hours to fix—in that smoldering light and abominable wind. We could have called for a flitter, but that would have meant leaving the car till dawn. It might be totally wrecked, and it could ill be spared. We drove on.

Cumae went under the mountains. Night thickened as clouds lifted. Presently it was absolute, save where our headlights speared before us, picking out bushes that tossed in the wind and occasional three-eyed animals that slunk between them. The air grew louder, thrusting against the sides, making them quiver and resonate, until the noise filled our skulls. Then the rain came, a cloudburst such as Earth has never seen, mixed with hail like knucklebones.

"We'd better take shelter!" I yelled. Laurie could barely hear me through the drumbeat and the howling. "High ground—get away from flash floods—" Lightning blinded me; the whole heaven was incandescent, again and again and again, and thunder picked me up and shook me. I strained over the charts, the inertial navigator, yes, this way, a farmstead . . .

We could not have reached it on wheels. The ground effect held us above mudslides, water avalanches, flattened crops and splintered orchards. Barely, it held us, though the hurricane tried to fling us back into the rising river which had been a valley. I do not know how long it was before we found the cottage, save that it was long indeed.

The house stood. Like most dwellings on Sibylla, it was a fortress, rock walls, shuttered slit windows, ponderous doors, roof held down by cables. In thin air, driven by high temperature differentials and solar irradiations, you must expect murderous weather from time to time. The barns were smashed, there having been insufficient manpower and materials to build them as sturdily, and no doubt the cattle and crops were lost. But the house stood.

I reached its lee, threw out a couple of ground anchors, put the autopilot on standby, and opened the escape hatch. Laurie slipped, the wind caught her, she almost went downhill to her death. I grabbed her, though, got dragged into the mud but hung on somehow. Clinging together, we fought our way through a universe of storm to the house. The door was bolted from within. Our pounding was lost in the racket. I remembered about hurricane doors before the hail beat us unconscious. We found one on the south side, an airlock-type arrangement which could safely admit refugees. At that, I had hell's own time reclosing and dogging the outer door before we opened the inner.

We stumbled through, into a typical Sibyllan home. One room served for cooking, eating, sleeping, handcrafting, everything. Screens offered some pretense of privacy, but here they stood unused against the sooty,

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unornamented walls. A brick oven gave reasonable warmth, but the single lantern was guttering and demon-shaped shadows moved in every corner.

A man and his wife sat on a bench by a cradle that he must have made himself. She had her face against his chest, her arms around his neck, and wept, not loudly, only with a despair so complete that she had no strength left to curse God. He held her, murmuring, sometimes stroking her faded hair. With one foot he rocked the cradle.

They didn't notice us for a moment. Then he let her go and climbed erect, a burly man, his beard flecked with gray, his clothes clean but often patched. She remained seated, staring at us, trying to stop her tears and comprehend what we were.

Wind, rain, thunder invaded the stout walls. I heard the man say, slowly, "You're from Earth."

"Yes." I introduced us. He shook hands in an absentminded fashion and mumbled his own name too low for me to catch.

"You can stay here, sure," he added. "We got food in the cupboard till the storm passes. Afterward, Jimstown's in walking distance."

"We can do better than that," I said, commanding a smile forth, trying to ignore our drowned rat condition, for they needed whatever comfort was to be gotten. "We have a car."

Laurie went to the woman. "Don't cry, please, my dear," she murmured; somehow I heard her through the noise, and her head shone in the murk. "I know your farm's wiped out. But you're leaving soon anyway, and we'll see you're taken care of, you and your whole fam— Oh!" She stopped. Her teeth gleamed, catching at her lip.

The woman was not pregnant. But, craning my neck, I, too, saw that the cradle stood empty.

"I buried her around sundown," the man said, looking past me. His tone was flat and his face was stiff, but the scarred hands kept twisting together. "A little girl. She lived several weeks. We hoped— And now the rain must've washed her out. I did think Sibylla might have let her sleep. We wrapped her up snug, and gave her a doll I'd made, so she wouldn't be too lonesome after we were gone. But everything's scattered now, I reckon."

"I'm sorry," I groped. "Maybe . . . later—" Barely in time, I saw Laurie's furious headshake. "What a terrible thing."

Laurie sat down by the wife and whispered to her.

Once, on our way home, she told me what had been confided that night, hoping it would influence my report. This was the one child they had had, after five miscarriages. The birth was difficult and the doctor did not think any more were possible.

I told her it was no surprise. Standing by that cradle, I had re-

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called the few children elsewhere and the many little graves. And at once, like a blow to the guts, wildly swearing to myself I must be wrong, I saw the face of the alien enemy.

Jules d'Indre sat behind his desk, a shriveled, fussily dressed man whom it was wise to respect. He nodded, quick dip of bald head, as Brenner and I came in. "Be seated, Citizens," he did not invite, he ordered.

I found the edge of a chair. My pulse thuttered and my palms were wet. Brenner leaned back, meeting those eyes, faintly smiling. "How d'you do, sir?" he drawled.

"Let us not waste words," d'Indre said. "Perhaps you are not aware how uncommon a physical confrontation in line of business is on Earth. I would normally use a vidiphone three-way, and during working hours. Can you guess why I did otherwise?"

"Informality," Brenner said. "No record, no snoops, no commitments to anything. Suits me. We lived old-fashioned on Sibylla. Not that we wanted to, understand." His smile departed, his voice grew crisp, I had a sense of sparks flying. "It gave us some old-fashioned ideas, however, like about the rights of man."

D'Indre's schoolmaster accent did not alter. "Rights are forfeited when one perpetrates a felony."

"Who's done what and with which unto whom?"

"The Colonial Fleet has been tied up on a useless mission for almost seventy years. Billions of plutons have been spent." D'Indre leaned forward. He tapped a pencil on the edge of the desk, *tick-tick* into an all-underlying silence. "The first thing I wish to know, Brenner, is how many were privy to the hoax."

The leather visage sought mine. "What made you report the attack was faked?" Brenner asked calmly, even amiably.

"I didn't want to," burst from me. "I tried—everything—my whole team did. We couldn't risk Earth being unprepared, if there was any chance a hostile fleet existed. And"—I noticed my hands reach toward him—"we didn't want to hurt you!"

"I know," he said, briefly serious. His tone lightened again: "But I've got a curiosity. The fake was arranged by some mighty smart men. Time must've faded the evidence. What put you on?"

"Oh . . . any number of things," I forced myself to say. "Close study of certain pictures turned up some unlikely perspectives in them. Analysis of crater material gave results that were consistent with the explosion of stationary plants, not of warheads. Any warhead we could think of needs a fission trigger, or it'd be too bulky. Analyzing the bones of supposed missile victims, we got clear indications that they'd died years earlier. Some of the diaries and correspondence, allegedly from the immediate post-attack period,

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contradict each other more than is reasonable, when you apply symbolic logic. I could go on, but it's in the report. No single detail conclusive, but no doubt left after the whole jigsaw puzzle was fitted together."

I wet my lips. "Sir," I said to d'Indre, "our team discussed suppressing the facts. We decided we couldn't do that to Earth. But you should know we did seriously consider it. We were that sorry for these people."

Tick-tick. "You have not answered my question, Brenner."

"Hey?" *The Sibyllan coughed.* "How many were in on the conspiracy? Just a few. Key men that my dad recruited. Still fewer today. The least number necessary to keep things shuffled around so nobody who wasn't in on it would suspect."

"That has to be true, sir," I blurted. "Ten thousand ordinary mortals can't keep a secret, or act a role."

"Obvious." *Tick-tick.* "How did you, or rather your predecessors, avoid massacring their own populace?"

"Well, everybody thanked his luck that he'd not been in a target area or was evacuated in time," Brenner said. "He heard about casualties, but they'd always happened somewhere else, in places where nobody lived that he knew. He couldn't check up, supposing it occurred to him. Sibylla never had global electronic communications, or fast transport except for some official flitters. What did exist—like a newspaper or three—was lost when the towns went. Took quite a spell even to re-establish a mail service. Meanwhile everything was confused, and refugees were getting relocated among strangers, and— The stunt wasn't easy, Dad told me. But it did come off. Later, histories and chronicles and such were written; and who had reason to suspect them? Everybody knew our numbers were way below the original forecasts, and dwindling. But accurate pre-disaster figures were filed only in certain heads now, that kept their mouths shut. And nobody had time to sit down and think hard. So it came to be taken for granted that the loss of people was mainly, if not entirely, due to the attack and its aftermath. I assure you, sir, nearly everyone among us honestly believes in the alien enemy."

His gaze challenged d'Indre. "Do what you like to me and my partners," he said. "We were ready for this, if the truth should come out. But you can't punish ten thousand just because they also got foxed!"

"Presumably the Gearch will not wish to do so," d'Indre said as if stating a theorem. "Nevertheless, the problem of assimilating them, so that they can make a living on this overcrowded world, may well prove insoluble. And individuals are apt to be subjected to mob violence. And it is politically impossible to send them to a different planet, when so

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many others desire that for themselves. Did the conspirators foresee this?"

"Yes," Brenner said. He sat straight. The big fists clenched on his knees. "But there was no mucking choice. We had to get off Sibylla. We—my father's group—didn't think Earth would fetch us just because we were slowly dying. We'd already received too many refusals of our pleas for help, only a little help. 'Too expensive,' we were told. 'They cope with the same problems elsewhere. Why can't you?' Unquote.

"Expensive!" The word ripped from him, together with a detonating one-syllable obscenity. I started where I sat. D'Indre did not change expression, but he stopped tapping that pencil. Brenner clamped lips together, took a breath, and went doggedly on: "To be quite frank, sir, on the basis of what knowledge I have, I wouldn't put it past certain officials to fake incoming messages from a colony that stopped sending."

For the first time, I saw d'Indre lose color. The pencil broke in his fingers. Doubtless Brenner noticed, too, for he paused through several quite still seconds before he finished: "Survival knows no law. My father and his men created a false enemy so their grandchildren could be saved from the real one."

"Which was?" d'Indre whispered.

"Sibylla, of course," Brenner said, almost as softly. "The world where everything was wrong. Where the sum total defeated us. Like a woman who wouldn't miscarry *too* often in high gravity, except that she never got enough ultraviolet or oxygen, and did get too many hard roentgens, and had a poor diet, and was overworked, and the very daylight wasn't the right color for easy vision . . . An entire world, fighting us on a hundred different fronts, never letting up. That was the alien enemy. We wouldn't have lasted another century."

I said into the silence which followed: "Earth has known some analogies. Like the Vikings, around the year 1000. They made themselves rulers of England, Ireland, Normandy, Russia. They ranged unbeatable through half of Europe. They settled Iceland, they discovered America. But they could not hold Greenland. They had a colony there, and it hung on for maybe four hundred years, always more isolated, poorer, smaller, hungrier, weaker. In the end it perished. When archaeologists dug up the skeletons of the last survivors, every one was dwarfed and deformed. Greenland had beaten them."

"I've read about it," Brenner said. "Men won in the end. Eskimos, who had the right technology for the place. Europeans, later, with sheer power of machinery. We, our race, we'll lick Sibylla yet, one way or another. But it's taken the first battle. In such cases, a good general retreats."

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D'Indre had recovered his poise. "I also know the history," he said. "Captain Simic's report was exhaustive. I wished, however, to add a personal encounter to my data store before deciding what disposal of this affair I should advise."

Brenner folded his arms and waited.

"As a matter of fact," d'Indre said, "Captain Simic has already proposed a solution which seems viable to me. Parts of Earth remain empty because development has been economically unfeasible. The tropical deserts, for example, the Sahara or the Rub' al-Qali. Sand, stone, drought, low water table or none, fierce heat and light, no worthwhile minerals. Converting them by machine would tie up too much capital equipment and skilled personnel that are badly needed elsewhere. Theoretically, the task could be accomplished by minimal robotic and maximal hand labor. But who among the proles combines the necessary attitude and hardihood? It will be interesting to see if the Sibyllans do."

Briefly, humanness broke through him. "I am sorry, especially for the children," he said. "But under present circumstances, this is the best that anyone can give you."

Brenner remained steady. "I sort of expected it," he said. "The captain dropped a few hints on our way down here. What about us, uh, conspirators?"

D'Indre spread his hands. "Your colony will need leadership. I daresay the Gearch will rule that providing such leadership is an acceptable expiation."

Brenner's own right hand crashed on the desk. Laughter roared from him. "Why, man!" he cried. "After what we've been up against, you think a nice kind Earthside desert's going to be any problem?"

Discussion dragged on. I took small part. My mind wandered and wondered. I didn't speak, lest I jeopardize the solution that was being hammered out. But take these people, I thought. A world battled them for generations. What those now alive had experienced was of no importance compared to what their germ plasm had experienced. With that natural selection in their past, what would they do with their future?

Ten thousand of them among billions—set down in the worst lands on Earth—could make a difference? Nonsense!

I got rid of the notion. I took command of my ship and went off on a voyage.

Eighty-five years later I came home and found that I had not thought nonsense after all. ■

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JACK WODHAMS

SPLIT PERSONALITY

The only completely proven type of mind-reading is very simple: You can read your own mind with a limited, but useful, degree of success. Which might be very critically useful!

Illustrated by Kelly Freas

She shouldn't have screamed like that. He'd had to stop her, had to. He hadn't meant to do it. He just . . . just— She shouldn't have screamed, that's all.

"The Council has finally agreed to permit the operation to be attempted," Dr. Linc Bransford said. "All that remains is to select a volunteer. And from all the volunteers, you have been chosen."

"So?" Romuld Mauger waited for more.

"We want you to fully appreciate what is being undertaken. Once you commit yourself there will be no turning back," Bransford impressed grimly. "It may take as long as two years. There are so many imponderables that it is impossible to calculate your chances of survival."

"What do you think the chances are?"

Bransford considered. "About ten-to-one," he said honestly. "Not long enough to forbid, not short enough to permit certainty. The whole of our resources will be behind this project. And we will be striving our utmost to achieve success."

Mauger squinted. "And if I come through I'll get to be a free man?"

"That's right, a full pardon. By then, of course, you will be the most famous man in the world."

"Yes." Mauger's eyes gleamed. "Huh! I like that. I say 'Yes,' you do all the work, and in the end I'm

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the one that's famous. Me. Me, Rom Mauger." He paused. "And free."

Bransford studied him. "It will not be easy. There is so much that we do not know. We have to be sure that you are perfectly willing to allow us to use you."

"If I say 'No,' someone else will say 'Yes,' and if it turns out good, why should they have it? This is that opportunity they're always talking about, isn't it? Will I ever get anything like it again—in here? Huh. No, count me in, Doc. I'm ready any time, the sooner the better."

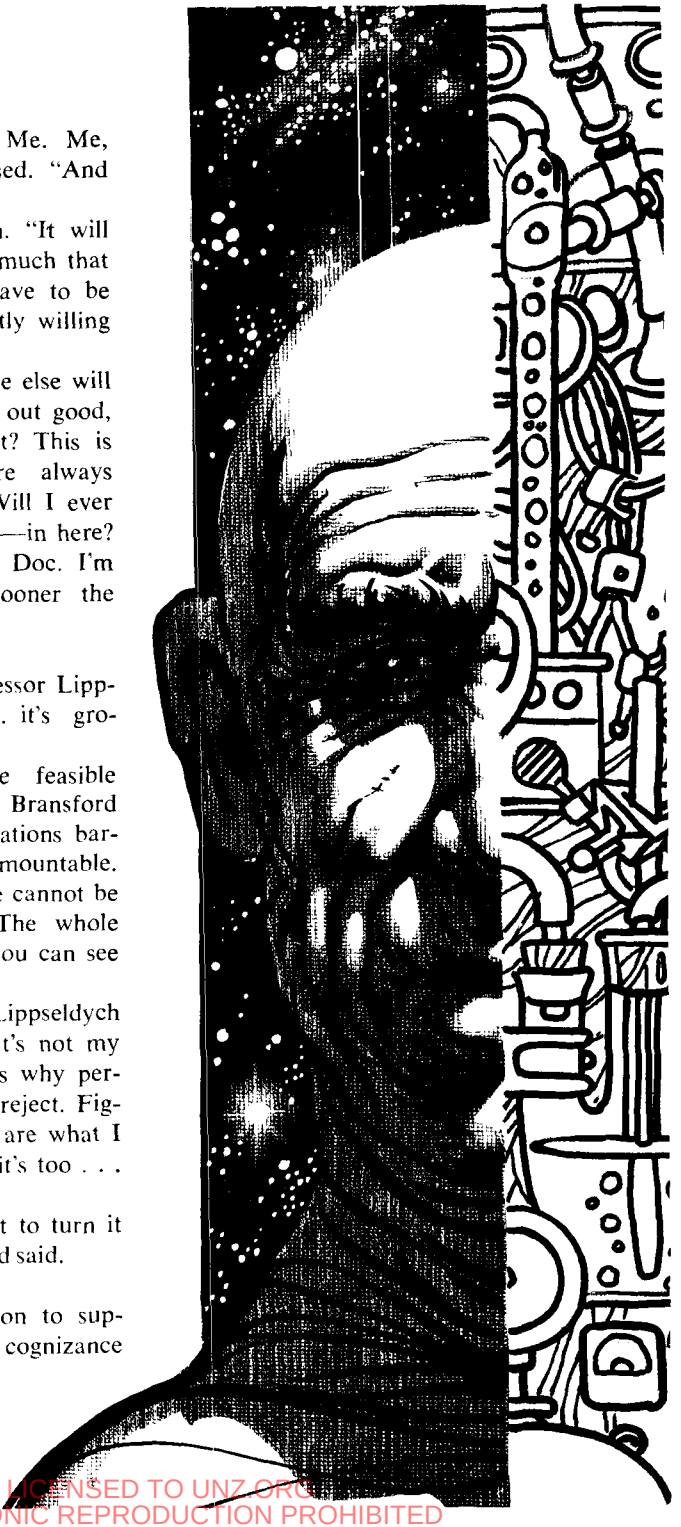
"I don't like it," Professor Lippseldych said. "It's . . . it's grotesque."

"Sir, has any more feasible means been conceived?" Bransford argued. "The communications barrier is otherwise insurmountable. We must at least try. We cannot be stagnated by qualms. The whole program is in balance, you can see that?"

"Yes, yes, yes." Lippseldych sighed. "I suppose so. It's not my line, of course, which is why perhaps my mind tends to reject. Figures, symbols and facts are what I understand, Linc. This, it's too . . . too abstract."

"We shall do our best to turn it into hard fact," Bransford said.

"We have good reason to suppose that such a state of cognizance



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exists, the paralysis from a stroke being the most marked and common indication. The operation we are about to perform on Mauger is primarily to positively establish the validity of our premise. Should our guess not be correct, restoration will begin as soon as possible. If, on the other hand, a condition obtains as we suspect, we shall proceed to the vital Stage Two and, God willing, on step by step to the final recovery."

Bransford rested. "We have the technical ability, but what we need now most is belief in ourselves and faith in what we are doing. Mauger's past is unimportant. What he will become and may achieve will be of tremendous benefit to mankind. His life is precious. We are not likely to get a second chance. I need not remind you of the opposition we have had to overcome to reach this moment.

"Now we are ready." He looked from face to face. "No more talking and planning. Yet it is strange, almost a shock, to at last reach the reality of action, to have nothing more to say. Except, to wish ourselves . . . good luck."

The surgical team took five days to cut Mauger in two.

They halved him equally where they could, favored the left side of his body where they could not. On the second day, the most delicate and infinitely painstaking, Mauger's head was split, his brain centrally divided—the left half being separately encased to serve the right side of his body; the right half being separately encased to serve his left. The casing was of tinted surgical plasti-bond, a substance that was applied to seal the severations of both halves of Mauger's body. On the left half the plasti-bond bulged where the stomach and the intestines were retained: One kidney, liver, the heart, one lung, the respiratory tract, tongue and false half-mouth, divided nasal tract, one eye, one ear. On the right half: breathing tubes, an artificial heart, neutral liver implant, the most sophisticated medical device and monitoring to check, balance, maintain and sustain life.

It was seven weeks before Mauger woke up.

He opened his eyes.

"No!" And he began to scream, vibrantly, silently. Two men appeared and bent over him; a nurse bent over him; she spoke, and the two men spoke. The nurse was joined by a doctor; he patted and said soothing words. All at once, Mauger's eyes rolled, unable to focus, seeing two different rooms simultaneously, hearing jabber, jabber, jabber, and himself yelling and not yelling, and strapped unable to move; frightened, no, no!

Sedation was mercifully swift and sure.

"Mauger?"

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Mauger opened one eye. He stared at the ceiling. He let his eyeball turn slowly to view the speaker. Bransford. Dr. Bransford.

"Mauger?" The voice was strained. "We nearly lost you."

Mauger's tongue ran along his teeth, over, onto plasti-bond. He shuddered. His skin crawled, his muscles bunched. Oh, God, oh, God, oh, God! They hadn't said it would be like this!

"Mauger, can you hear me? We're sorry about what happened. It was stupidly unimaginative of us not to take care that you did not awaken at the same time."

Too late. What now? Oh, God, it had been done. He couldn't take it. It would have to be *un*done. It was impossible. He couldn't go through with it. He couldn't, he couldn't, he couldn't!

"Mauger, can you talk? Can you hear me?"

A dead plastic cheek. Mauger gulped. There was an unfamiliar sliding in his neck. He choked. His eye squeezed shut. He was shaken with nausea.

"Mauger!"

The alarm again, the rapid attention, the prick in the arm, the instant oblivion.

Patiently they adjusted drug dosages to bring Mauger to the threshold of reality, to give him objective self-awareness to orientation, to accept, comprehend, cease to attempt to reject, to sublimate the shock, the unappreciated blind terror occasioned by his condition.

It was ten more days before Mauger was able to talk. All this while the right half of him slept.

"Mauger, can you hear me?"

"Doc." It sounded funny. Was that his voice? "Doc, is this me?"

"Yes, Mauger, it is you," Bransford answered quite seriously.

Mauger's left eye blinked. "It don't seem like me."

"It's you all right. You've made it."

"Made it? Doc, I'm . . . I'm scared. I didn't know it would be like this."

"Nobody could tell you what it would be like, Mauger. It's never been done before. You're the first. And the need may never arise to do such a thing again."

"I . . . I don't like it, Doc," his voice slurred through severed lips. "This . . . this thing in my mouth . . . it tastes—" Sweat started on the half-face. "Doc, join me back, huh? You can join me back?"

"We can, but we won't," Bransford said bluntly. "We . . ."

"Why? Get someone else! I want out! Get me back! Nobody said it would be like this!"

"We'll put you back when we're good and ready, and not before." The stress he had been under, the torture of doubt, brought the words snapping from Bransford. "You're supposed to be a tough, hard man —that's why you were chosen." He

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leaned forward. "The operation itself was an unqualified success. Doesn't that mean anything to you? Don't you realize what we have achieved?"

Mauger gulped, the half-face registered distaste. "Yes? So you did it. So *un*do it! I don't want no more!"

"Oh, no, Mauger, you don't quit so easily. Too many people have worked too damned hard," Bransford growled. "You've pulled through and we're sure now that you are capable of going on."

"Yes? And supposing I don't want to go on?"

"You will. With your co-operation we'll make it as easy for you as we can."

The half-mouth twisted and the left eye challenged. "Yes? And just say I don't co-operate?"

"Then," Bransford said with finality, standing up, "the longer it will be before we slap you back together again . . ."

Stuck. Resentment, panic, tantrum, all were dispassionately dealt with. There was nothing else he could do. He co-operated.

For some time they kept one half of Mauger sedated while the other half was awake. Mauger missed the tongue and . . . other things absent from the right half of his body. He did not like having to use his right hand on a keyboard in order to communicate. The numbness and . . . emptiness of his right half . . . upset him. He preferred his articulate, more self-sustaining left half.

"Are you aware of the sleeping part of you?" Bransford asked.

"Yes. It's odd. It's one of the things that used to bother me. Like now, for instance. I know the nurse is in the room. I can hear her and smell her. It was hard at first to tell the difference but," Mauger slowed as he caught the significance of his own words, "I'm getting the way of it now."

Bransford noticed, too. "Do you think you would be able to cope now if you were completely awake? We would like to test your ability to co-ordinate. You have excellent control at the moment. What do you think?"

Mauger's left eye was quizzical. The half-bonded chin moved and the lopsided half-bonded lips parted. "Have to sometime," he grumbled. "Otherwise it'll take forever."

Day by day Mauger became more relaxed. He became more familiar to himself, more adapted to his condition. Shortly, he could be unstrapped, to exercise one arm, to cycle one leg in the air. And could be questioned on his unique sensations.

"It's no good. I can't keep both my eyes open at the same time. It's too confusing. I just can't focus and it sends me haywire."

"All right. Cover one eye. Hearing?"

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"Not so bad, but bad enough. O.K. when it's quiet in one place, but the direction of sound can set the wrong part of me looking. Can't handle being questioned from both sides at once, but noise mixture is not much worse than a busy intersection. Can, well, shut it out. Picking some of the little indirect sounds is, at times, difficult."

"Good. Smell?"

"I smell things O.K., but I can't say which one unless I know otherwise. I can pick out two or three scents at once, but I can't say where it's at unless I stop up one side."

"Right. We'll do a thorough series later. And how do you feel—generally," Bransford inquired. "Can you operate the writing machine while you are talking and listening to me?"

"No. I can only do one thing at a time, Doc. If you want me to do a special thing, it will take the usual amount of . . . of figuring."

"I see. But you can apply concentration wherever it might be required, correct?"

"Yes. Yes, that's about it," Mauger said. "Aaah! I mustn't open both eyes at once. It makes me dizzy. You'll have to supply me with eye patches. Huh! I never could keep one eye shut and one eye open for any length of time."

"I'll see to it," Bransford said.

"Fingers are O.K., but I keep looking through them to see what's going on."

Bransford smiled. "We'll get you a couple of Captain Kidd flip-down pirate specials."

Mauger, for the first time, grinned. It was a shocker, but Bransford was glad to note it. It was a good sign.

The weeks and months had taken it out of Bransford. He rubbed the edges of his eye sockets. "He's holding well. Mentally we have him as rational as he is ever likely to be in the state he's in." His hands dropped. "He is surprisingly sane, in fact, more so than we could ever have hoped for. I think this is a testimony to his personality traits rather than to the human capacity to adjust to the most dismaying of conditions."

"And physically?" Professor Lippseldych said.

"We've started to move his left around. Worried him a bit at first, but he soon got a kick out of being a tourist. His dosing is down to minimum now, as it has to be if we want to be sure of his sensible responses. As far as any person may be, Mauger is perfect and able to carry out the duties that will be required of him. We need him to be as fully aware as possible."

"How soon do you think he will be in fit condition to go?" Lippseldych asked.

"Well, now, I'd like another six to eight weeks. He's slow on the writing machine and needs more training."

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It was rest time. Mauger pushed the screen of the magazine scanner away. How much longer? God, but he was getting tired of lying on his back. His left eye rolled. This was the paraphernalia room—bleeper gadgets, psychological reaction and reflex testing apparatus, co-ordination whozits, heart, blood, and God-knew-what-else. He tired of it and decided to go upstairs.

His left hand came up and turned down the shade over his left eye. His right hand came up and lifted the shade back from his right eye. His right side was tipped a little that he might more conveniently gaze out from his cot onto the terraced roof, an area made green and cool with the fronds of many palms, ferns and vines. Additionally a gentle fountain burbled unobtrusively into an oddly soothing serpentine aquaria tube.

Mauger watched the indolent fish. They were in prison. Was he still in prison? This was worse than prison. Or was it? He had never had such attention in his life. Sure he was doped, but not that much. Was it so bad? No. No, it wasn't so bad.

But he'd like to walk again though. Funny, he never used to walk anywhere hardly. Yet now, now he wished he could walk for miles and miles and miles. Even around a yard?

If that woman had only kept her trap shut . . .

Aw, hell. The fingers of Mauger's right hand sought the buttons of the TV control.

Professor Veydel Lippseldych explained. "When a departing vehicle on plus-plus approaches and perhaps even passes object-relative light speed, communication between the vehicle and its starting point becomes impossible. Deterioration is rapid, and location beaming becomes progressively less accurate and more tenuous in form.

"The plus-plus continuous acceleration craft throw space open to us. Theoretically, these craft should enable us to traverse the heavens in acceptable voyaging time. However, as you all know, during their trials we lost contact with the first craft and, subsequently, also with the second. At no time since have we been able to re-establish contact with either vessel, and they are . . . presumed lost."

Lippseldych wiped his hands on his vest. "We must have communication. There are unexplained factors that we cannot comprehend. The analogy between ancient seafarers and space explorers cannot be bettered. With no compasses, charts, no conception of longitude and latitude, or even of the shape of the world, the mariners of old endeavored always to keep the shoreline in sight." His hands bothered him. He tucked them under his armpits. "Trailing these two vessels we tried to keep the shore well in view. But we

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missed. They slipped us, lost their navigational bearings I suspect and, in an effort to reorientate shot off deeper into the vast ocean of space. Our tiny solar system," he said gravely, "can easily get misplaced against a never familiar constantly changing background.

"The problem has more puzzling features than we bargained for. We had thought that the LOK computerized fix on sixty out of one hundred twenty of the most distant points of reference would give us a positional point close enough to identify our own home locality should we wander astray. But apparently not. Both the missing vessels were lost while tracking for Alpha Centauri; the second one being most meticulously catered to in an effort to determine what could have gone wrong with the first. Again the same troubles—communications scatter then nothing."

Lippseldych frowned. "Communications or no, they were capable of returning by means of their own instruments—or should have been. Like Columbus, they have sailed off into the blue . . . only they seem unlucky enough to have gone over the edge."

He unfolded his arms to bang his hands against his hips. "It is most frustrating. We have the means of transport, but need an infallible guidance system. To obtain an infallible guidance system we need to investigate and study. To investigate and study at speeds commensurate with journey-time practicability has involved the direct loss without return—no pun intended—of two extremely expensive vessels."

Lippseldych looked at his hands, stuffed them into his pockets. "The potential of the plus-plus craft is enormous, but any development program is doomed if we cannot devise some means of overcoming the communications difficulty. We lost contact and the voyagers cannot help us, and we cannot help them. They may be alive, they may be dead—we do not know. Being uninformed we are helpless, and it is obvious that, unless we can break through this barrier of continuing ignorance, the plus-plus craft will become redundant for our time—will be as anachronistic as a da Vinci airplane."

He rubbed at his thighs through his pockets. "I was opposed to the experiment with Mauger. It seemed —bizarre is too restrained a word —such an inconceivably macabre proposal. But, it has transpired . . . in a manner more fortunate than I ever could have supposed. And, I confess, our endeavors in other ways have been abortive. I still feel some reluctance, but, under the circumstances, after such brilliant work by Dr. Bransford, we now may hope that Mauger may provide the vital and essential link to . . . to the monitoring station."

He could always pretend,

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Mauger thought, to lose touch with himself. What would they do then? The deal was in his favor. A test-failure would put him together—and outside, right? Hard luck, fellahs, too bad. They'd had it all their way, it was about time. How could they ever know he was faking?

"I . . . where are we?" His voice was sharp. "Where are we? I want to know! I . . . what's happened to my right side?"

"What?" Bransford said. They were at forty thousand feet making eighteen hundred knots. A quarter of the world separated Mauger's two sections. "Have you lost contact?"

"I . . . I can't feel any more." Mauger clutched at Bransford's arm, pouring on wide-eyed fear. "What's happened? Something's happened! I've died! It's gone! I can't feel it any more!"

Bransford grabbed him quickly, forced him back down the little he had managed to raise himself. "Easy! Easy!" he rapped. Mauger had never seen his eyes so brightly intent. "Get a grip on yourself."

"But it's gone! It's lost! I'll never be recovered now! It's been broken!"

"No." Bransford signaled a helper. "Hang on, Rom. We'll reverse course and I'll call Base. Perhaps that part of you has just suddenly gone asleep."

"No! No, it's not like that! It's dead! It's not me any more!"

"I'll go see," Bransford said brusquely. He nodded to his assistant to take over the calming role, and left the alarmed Mauger to stride into the screened relay bay.

In three minutes he was back beside Mauger. He looked down into Mauger's worried left eye.

"Well?" Mauger demanded. "What's happened? What's happened to me back there?"

"We think you're fooling," Bransford said dryly. "Now, we can either hit your big toe with a hammer, or we can stick both your eyes open. Which will it be?"

Mauger's half-face scowled. He thought for a few moments. "O.K., O.K. Just wanted to see if you guys were on the ball."

Bransford smiled. "I hope you're satisfied that we are."

"The second vessel carried a member of an alleged telepathic team," Professor Lippseldych said. "This is not, as yet, by any means an accepted, proven and reliable means of communication, but it does show what measures we were prepared to take to glean the least hope or hint in the event of an accidental repetition. Which, in spite of our careful precautions, occurred."

Lippseldych was seated in an adequately capacious swivel chair. Squat and elegantly voluptuous, the chair suited him by contrast, setting off his crumpled clothing nicely.

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"The part of the team held here could produce nothing comprehensible. We didn't expect her to, it was a very long shot. What she receives is garbled and fractional, and the bits and pieces are like a Chinese puzzle complicated by chronological discrepancy. The main comfort, if comfort it is, is that she claims that the crew is still alive.

"However, with this man Mauger it is different." He twiddled a marker between his fingers. "Mauger is one person divided into two. He has being in two places at once. All the tests he has undergone so far have shown that neither distances nor obstacles interfere with his unified sense of 'being.' Dr. Bransford has determined that this sense of existence transcends simple brain function, is something above and beyond the tumbling of thought processes—it is a consciousness that is capable of appraising the thought that does go on." He shrugged. "It's the soul, if you like.

"Mauger has been divided. We have two of so many of our parts that it might be mooted that what has been performed surgically might ancestrally have occurred naturally. Be that as it may, the division of Mauger's brain did not destroy him as a unit, did not divide him as a person as, logically speaking, it should have. Having my own area of bafflement to contend with, I am not inclined to question these results, but rather to use them to help clarify the absolute opacity that I have met in my own field."

He tucked the marker into his top pocket. "I am almost afraid of the hope I have been given through Dr. Bransford's work. It has given us an opportunity. We must take it. Our third plus-plus craft is being prepared—"

They were a good team, Bransford thought, a damned good team. Mauger? The one passenger, the passenger with the key. Had they done right to use such a man? Someone more sensitive, drugs or no drugs, would have gone into inescapable trauma. An honest idiot, then? What right had they to take advantage of ignorance? But did they really have the right to use Mauger?

"No," Bransford said aloud to his face in the mirror. "But we had to have somebody—somebody *right*. Don't look for excuses, Bransford. One man. And you *know* that it is the only way."

He dragged on his jacket. A damned good team. With luck . . . yes, with just a little more luck—

Press Conference.

"Mauger has settled down." Professor Lippseldych clasped his hands behind his back. "And," he said, "so has the crew. Another couple of weeks ironing out the best cross-checking method and we

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should be set to extend the trial closer to the limits."

"The limit of the speed of light, Professor?"

"What? No." Lippseldych lifted his heels a couple of times. "No, that's what makes it rather peculiar. The trouble occurs around 9/10ths L.S. or, if you want it more exactly, .8902. The, ah . . . transition is comparatively swift. Making allowance for the anticipated recessional discrepances is not enough. In fact," and he now folded his arms, "we discovered after much painstaking calculation that recession seems to be a negligible factor."

"What do you think you have to contend with, Professor?" another asked. "A light barrier, after the style of the sound or heat barriers? Or do you think it is a time barrier?"

"Ah, now, I have said before, a light barrier cannot exist. A vehicle in space, like a star or planet in space, is never actually going anywhere of itself. Bodies, however great or small, have calculable movement only in respect to each other. This being so, speed can only be determined in relation of one body to another."

"But you say your difficulties arise at around 9/10ths L.S. It is when craft reach this speed that you lose them, correct?"

"According to *us*, yes, 9/10ths," Lippseldych said, "but not 9/10ths according to *them*." He paused. "That is, when two bodies are parting from each other in space, it is a matter of unresolvable conjecture to decide which one is leaving. We tend to think, consciously or unconsciously, that our Earth is a stationary platform. Pre-Galileo persistence, I call it, for our motion prohibits a base rock for observational veracity. You see, as well as inherent rotation, we circle the sun at 66,000 m.p.h. and our entire solar system is estimated to be moving at eleven miles per second in the galaxy. God knows how fast our galaxy may be traveling in relation to other conglomerates beyond the universe. Some of the farthest detectable objects are said to be leaving us at ⅔rds L.S. but, conversely, it must be kept in mind that *we* are leaving such objects at an equal speed. Again it is anybody's guess which of the two is the more immobile."

"Yes, Professor," an unsmiling man said, "but the speed of light is finite. This is well established. The two earlier craft were approaching L.S. when contact failed. Surely it is obvious that there must be a time/speed connection here somewhere?"

Lippseldych scratched his head. "Yes and no. You must grasp that these craft were in no way intrinsically traveling at light speed. The craft themselves were only traveling at a constant ¾ to 1¼ G. When contact was lost they were

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traveling at 9/10ths L.S.—according to *us*. They were not necessarily traveling 9/10ths L.S. according to Ursa Major or Cygnus A. Depending upon the observer's location in space, the craft could have been moving forward at many times L.S.—or possibly moving backwards at 3 m.p.h."

"Exceeding light speed, Professor? Do you think that's possible?"

"Again, yes and no." Lippseldych stabbed his hands into his jacket pockets, stuck the corners out like a faking two-gun Pete. "To surpass the structure, quality and phenomenon of light is not possible, but for one object to travel at over 186,000 m.p.s. relative to another object is not only possible but unavoidable. If a heavenly body is departing from Earth at 2/3rds L.S. in the opposite direction, it would seem logical to suppose that craft and heavenly body would part at 1⅓rd L.S., wouldn't it?"

"Professor, going back, you said recessional effects were negligible. Can you explain why this should be?"

Lippseldych shook one hand free for a momentary wave. "How can there be a loser? Does the craft leave the Earth, or does the Earth leave the craft? Which one should make compensation? Which one is going forward and which one is going back?"

"Then there is no time dilation?"

Lippseldych jazzed his eyes. "Aye-yi." He brought his pockets as close as they would go. "This is what we wish to discover. Our preconceptions have been in error. We are still ignorant of the relationship between speed, time and space. It is this ignorance that we are hoping, aided through Mauger, to repair."

"I'll be glad when it's over." Bransford felt, and looked, fatigued. "After this I 'm going to have one long, long vacation."

"We all will," Lippseldych said. "Drink?"

"Thanks, yes, just a small one. Might help me unwind. This close my mind keeps skittering over all the things that could go wrong."

Lippseldych poured, handed him a glass. "Linc, I'm glad my responsibilities are general enough to forbid my departure. I'm keyed up enough as it is without actually going on the trip." He lifted his glass. "You have my heartfelt good wishes for an uneventful revelation of a mystery."

"Um-m-m."

Lippseldych imbibed and savored. "And Mauger? What of his attitude?"

"I'd say he was probably less worried than the rest of us. We have his diet pretty well just so, and can keep the balance pretty well with minor adjustments." Bransford tinkled the ice in his liquor. "But how we may cater to a sudden time differentiation we don't know. The half knock-out may not be

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swift enough. The shock may be fatal. Certainly his equilibrium could go in a flash. In fact, a great many unforeseeable things could happen and, really, our card house hardly needs a puff." He sipped his drink.

"Ah," Lippseldych acknowledged, "you feel that the doom quotient is high. Yes," he said candidly, "there is too much speculation for my liking—for anybody's liking. I don't like it, never have liked it. But superior alternatives just have not presented themselves."

"There are some things that a machine can do, and there are some that a machine cannot," Bransford said. "No machine we can devise at this time can perform the duty we require. It has to be a man. It just *has* to be a man."

The right eye of Mauger stared out along the rooftop terrace. It was evening. Soft artful lighting made the garden a cool grotto. The fish were deeply metallic, their colors richly muted, their movements gracefully lazy. The fountain susurrated close to aural invisibility. It was all very soothing. It was all very peaceful.

Thank God they were going tomorrow, Mauger thought. Much more of this messing about and he'd have gone mad.

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"We're on our way," Bransford said. He held up crossed fingers. "In approximately thirty-seven minutes we shall be reaching the crucial speed away from Earth of around 9/10ths L.S. If all goes well, we could be back before the end of the week."

Mauger's left eye was watchful. He grunted.

"They're going to cut out close to the limit. We're going to have weightless spells of an hour or so while they check standard communications. It's going to be tedious for a day or more boosting up in short bursts. But in one of those short bursts we're going to cross whatever it is, and that's where you will come in."

"I just can't wait," Mauger said flatly, his eye alert. On his special bunk, left side out, he presented a near-normal profile.

Bransford lightly punched Mauger's left shoulder. "I'll be with you at all the important times," he said, "and Ray and Wylie will be keeping constant watch on you between them. Still, should anything happen while I'm not here, don't forget to hit that bell. And hit it if you notice anything untoward at all."

"O.K.," Mauger said. The fleshy parts of his lips curled. "I know what to do. Don't get anxious."

"Well don't forget." Soberly Bransford said, "One careless slip and we could all be gone." He gave Mauger another nudge with his fist. "Old son, we haven't taken the trouble we have just to bring you along for the ride."

Weightlessness. One-G boost for one second. Weightlessness. Course set to return to starting point after rolling in a circle 200 million miles across. Messages relayed and received. One-G boost for one second. Weightlessness. Another huge coasting circle. And again, checking, over and over, creeping with deadly patience to the borderline that was known to be near .8902 L.S. away from Earth.

They were not home by the weekend.

After one hundred twenty hours there was no sweat left, routine had sapped the superficial tension away. The last boost had taken them to .89028 L.S. away from Earth. Everything stayed normal. What could happen? They were going to disappear? The standard code went out; the standard code came back. Your watch buddy, I'm sacking out.

Mauger had become restless after the first two days. He began to gripe and niggle as more and more hours passed.

"Five days! Why don't they just blast through?" he grouched.

"There's no rush," Bransford said, juggling feed additives in his head. He took the scribble plate from the officer who clacked in, and held it up for Mauger to read.

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Mauger scanned it. His half-head moved infinitesimally.

"Got it?" Bransford said.

Mauger's left eye closed. "What do you think? They're reading it now."

Bransford cleaned the plate and gave it back to the officer.

The officer looked at his watch. "In about eight minutes we'll be on boost again. We're really close to it now."

He'd said that last time. And before that, and before that—

"All right," Bransford said, dismissing him, "we'll be ready."

"Another boost," Mauger grumbled. "Another lousy G for another lousy second. At this rate we'll be here for the rest of the year."

"Is Mauger still in contact?"

"Mauger?" Bransford's head turned from the screen to check his charge. "Rom? Are you still in contact?"

"Sure. Nothing's happened." His single eye shuttered in annoyance. "I'd have told you if it had, wouldn't I?"

"He is still in contact, Commander," Bransford told the image. "Why? Has something unusual occurred?"

"Yes. The boys are working on it already. Could you come to my cabin? I'd like to talk to you privately."

"Certainly." Bransford dropped his tractor boots to the floor, cut out the screen. Intuitively his pulse told him this was it. He gazed keenly at Mauger. "A technical hitch, I think."

Mauger's left nostril dilated. "I hope they don't take all day to sort it out."

Commander Caldard was not the husky drawer-jawed space hero of popular imagining but a tall, rather thin man, and rather solemn.

"We're in trouble, Linc," he said calmly. "We're suddenly moving a great deal faster than we should be. And we're not sure where to. Up to a point we kept tabs on the Doppler effect and accounted for intensity variations from the heightened down to the eliminated. After the last boost, though, we— It's the same Universe. we think, but it's shifted. Or rather, we're shifting, at a tremendous rate. That is, our directional progress has increased, and our position in space has altered, is altering, much faster than we were prepared for."

"Do you know where we are?" Bransford asked.

"We are trying to define a precise location," Caldard said, "but there are a large number of new stars which do not, well, 'fit,' and displacement is making it difficult to sort out those we don't know from those that we do."

"What about the most distant objects fix? Surely you haven't lost those?"

"The transition, whatever it was, upset *that* navigational aid, and

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again we cannot be sure that the positions registered are of the original objects sighted. The spectro balance is calculably adjusted, but the swiftness of the change permitted no delicacy, and there are inconsistencies and exaggerations that, without knowing the factors involved, leave us with a lot of guesswork."

"Can't you simply turn around and go back?"

"Linc, I wish we could. But we are not on thrust. What do we do, turn over and drive back till the critical speed is reached? For how long? We don't know how far we've gone. And how can we be sure that we do not deviate from the correct path by the least fraction?

"No. It is essential that we first find out where we are, and how fast we are moving, and in precisely what direction. I don't think that it is as bad as it looks," he added, "it's just rather confusing at the moment. But we are better equipped than the previous ships and, uh, we're probably not as far afield as we might be led to believe."

"Can't we stop, or slow down or something?" Bransford asked. "You have the drive, can't you use it as a braking force?"

"Did you ever speak with Lippseldych?" Caldard countered. "Right now, with the thrust off, we are, technically, not moving. But our position relative to our own sun has changed . . . is changing. There's hardly a glimmer behind us now. We lost a few before, but now there is just an area of absence there."

"Can't we head back there steadily, if that's where our sun is?"

Caldard was patient. "That is not necessarily where our sun is. If we charge back there—and miss—we could be a lot worse off than we are now. We have record of our entry position in regard to our present surroundings, and we are processing this information in order to loop back as nearly as possible to this exact spot. Again, such a circling course will raise its own problems, but we're hoping for the best."

"So we're lost, as the other two were lost." Bransford nodded. "The unexpected expected. Feelingwise, it wasn't very dramatic."

"You sound disappointed. It's dramatic enough for me," Caldard said. "We have to send as much detail back as we possibly can."

"Ah, yes. And Mauger, I take it, is now our only contact. Like the rest of us, he seems to have noticed nothing physically. And that is a relief."

"I first viewed him as eccentric and not altogether pleasant supercargo," Caldard said. "Now, as a link to rational people who will be able to regard our state as a problem rather than an experience, we may, if you can ensure that he does not break down, be able to uncover some answers. Ground facilities

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are much better fitted to cope with the data than we ourselves. You can appreciate that I'll want all the assistance I can get."

"You'll get it." Bransford turned and pressed the button by the door. Slim rods pulled the curtaining material back. "Give me ten minutes to prepare, then start sending it in. They'll be in agony back there waiting for us."

Bransford put one foot through the doorway, and was struck by one last puzzling thought. "Oh . . . what happened to our destination? Surely Alpha Centauri did not disappear, *too*?"

"Wrong," Caldard said. "In contrast to what we have behind us, what we have in front now seems to be an intensely bright cluster covering about ten degrees of arc. It's almost as if we were in a funnel, heading with all the other drops to a misty luminous pool."

"I'm tired," Mauger said. "My arm aches and my fingers are sore."

Bransford rested. He was very tired himself. Mauger had been transmitting nonstop for nearly four hours. Bransford judged it time to take a break.

Bransford stretched himself and yawned. "Yes. Send them XXX 30. They should have enough now to last them a while. Ask them to give you massage and look over your pinkies."

Mauger tipped back the patch on his left eye. His eyelid fluttered as his pupil adjusted to the light. "They want to send."

"No." Bransford was adamant. "XXX 30 P.V. The doc insists. There's no sweat." He closed the flap on the data dictator, pointedly pushed the mike to the receiver away from Mauger's head. "It's time for a little sustenance." He signaled to Wylie. "Do you want to handle the bottle or shall we pump it straight in?"

"The bottle." Mauger flopped his left hand out from the elbow. "That writing machine is hell. If the words made sense it would be easier, but this coded stuff . . ."

"Oh," Bransford pushed at his anchors and straightened his body from the spaceman's shallow "S", "it's their turn next. You'll have an easy run for a while just gabbing." He took the bottle from Wylie, placed it in Mauger's hand, put the end of the tube into the left corner of Mauger's mouth.

Mauger poked a bit getting the tube just right, then used his tongue to seal the plasti-bond side of his lips.

Bransford took his own bottle from Wylie. "I hope your vocal chords are in good shape."

"Mm-m-m." Mauger hung his bottle in the air, took the tube from his mouth. "We've lost ordinary contact. We've gone like the other two, huh?"

Bransford sucked, gulped. "I told you, there's been some strange changes outside."

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"But . . . we will be able to get back, won't we?"

Bransford spat his tube from his mouth sideways. It began to describe an arc. "With your help, yes. That's why you're here. This is the payoff. This is where you start earning your keep." He caught the returning tube in his teeth, watched Mauger.

On Earth Mauger's right side duplicated the dampness that began to show on his left. "You mean . . . me?"

"You're catching on. Do you begin to see how important you are?"

"I . . . Suppose I fail, or . . . or something like that?"

"Then we'll all be lost, maybe for good." Bransford looked at his bottle as though surprised to see the plunger on the bottom. "That's a risk we're prepared to take."

"But . . . but what about me? I've *got* to get back."

"Yes." Bransford was faintly sardonic. "There were only a handful who had anything like your combination of aptitudes, yet even so it was fantastic odds against your retaining your sanity. That you have managed to survive so well, both physically and mentally, has given me greater respect for automated evaluation systems. A key factor was your limited imagination. If you take my advice, you won't try to start using it now."

"He's not a machine," Bransford said. "He has to rest. Straight question-and-answer routine only tangles him up and the last thing we want is for him to get confused. We have to be patient and pack the items as concisely and explicitly as possible." He gave himself a deep breath. "Have they given us anything encouraging so far?"

"Not really. It's too soon. Verbal encouragement, but brief. Mostly questions."

"Do you have the answers?"

"Some." Caldard's tone was noncommittal. "How is he?"

"In fair shape. It won't be wise to drive him too hard. Another two hours and I want to rest him for four."

"There's a helluva lot of information to go," Caldard objected.

"I can't help that," Bransford said firmly. "He's the most delicate instrument on board. He needs the whip a little, but not till he drops. He must not become unduly fatigued. He's all we have, remember."

"All right." Caldard did not argue. He palmed his forehead. "I'm glad my hair is already gray, else I'd worry—"

The patch covered the left eye. Mauger was dully repeating what his right eye saw far away on Earth. The symbols were meaningless to him, and his voice was a disinterested drone.

". . . Frame KL 5. J 23° Aston Charlie 4 Cent A M 87 King's

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Horses M 13 Frame EG 102 Famber grid 262-267 87°26′ . . ."

Bransford stiffened. His light drowsiness vanished, and his eyes opened to alert slits. King's horses. And all the king's horses, and all the king's men, could not put Humpty together again.

Mauger continued to mouth words, letters and numerals, unconscious of significance. Bransford listened acutely. Shortly came the details.

"So we are not off course at all?"

"Apparently not," Caldard said. "It just seems that our speed has been multiplied in some manner. The results are there if you care to look at them," and he indicated the decoded and integrated calculation sheets. "We are maneuvering to occupy the exact post-transitional area we first encountered."

"Then we can go into reverse?"

Caldard had the gravity of an undertaker with many burials to his credit. "It is not so simple. When we get to the transitional point we will be theoretically, something like forty minutes from home—*at the speed that we left it*. However, our relative speed is now about ten times as great and, if we drive back from that point on plus-plus, we will pass our home base in about four minutes, and travel on for another thirty or so before breaking back again. The question is where to stop and how. We are gaining considerable knowledge, but it is the kind of knowledge that helps tell us how little we really know."

"Only forty minutes from home!" Bransford was startled by the concept.

"Only four or five at our present relative speed," Caldard said, and with grim humor, "but how we are to slow down in order to wave as we go by we are not at all sure. You see, we do not know which way is reverse. Accelerating back along our path may raise our intrinsic relative speed even higher, rather than slow us down. Also, we are by no means sure that the transitional speed we achieved relative to our original starting point will be the same for other points in the Universe. There could be an infinite number of variables."

"Less than an hour away and we are still lost," Bransford said. "It seems ridiculous. Cal, we've got to get Mauger back."

"We've got to get us *all* back," Caldard said.

"Yes. Yes, I know. But his right side is showing signs of deterioration. How much longer will it be before you have something definite?"

Caldard's saturnine face set to a distant semibrooding gaze. "A return pattern is being formulated. It is essential that Mauger's services be retained as long as possible. How rapidly is his capacity being impaired?"

"Rapidly enough to be worrying. Once this job is done there will be no second try. The longer we hang

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onto him the less *his* chances get. I want to freeze him, Cal. O.K, so he is not too bright and he once killed a woman, and that makes him a dispensable commodity. But he's my charge, Cal, and I want to get him back. Which means that I want to know as soon as you have all the information you require." He looked Caldard levelly in the eye. "Don't hold out on me, Cal."

"How do you feel, Rom?"

"Right side is tired, Doc. I don't know. Don't feel right." The left eye was bright. "Doc, is . . . is it dying?"

"Not if we can help it. Try and relax."

"It's hazy. Am I doped up?"

"Some. We're beating the clock. We're keeping you open for a couple more hours in case of emergencies, then we're going to put your right side out in suspension. Don't let it worry you if it feels dead before you go to sleep up here."

"But . . . but you might need me. I . . . *have* to get back."

Bransford squeezed his arm. "We'll get you back."

Caldard said, "It has been calculated that we are now traveling ten times L.S. in relation to our home base. While we do not know the how or why of the precipitancy of the law, a reason for the effect has been postulated. At our departing speed of 9/10ths L.S. our locational interdependence became disrupted. Anticipated recessional differences were both less, and sharply more, than expected. Now that the effect is known, Lippseldych and his team have been able to work back from this to cause.

"Simply, if two objects are parting at 9/10ths L.S. and light continues to pass both objects at a consistent speed, it would seem obvious that the second upon one object should be ten times longer than on the other. However, as it is impossible to decide which object should have the honor, at a certain stage a natural assertion occurs which restores the balance by creating a time interval between the two points.

"Thus, at 9/10ths L.S., for example, once the barrier has been traversed, orientation of existence is maintained by a time 'gap.' At 9/10ths L.S. this gap is a factor in the order of ten, which means that separating at this speed for twenty-four hours would place the two points ten days apart."

"But we're neither in front nor behind Base time," Bransford said.

"No, no. As I said, the orientation of existence is the same, but there is a time-distance factor of ten between us. One day out, a message sent either way would take ten days to reach its objective, ten days upon either point, do you follow?"

Bransford struggled with it. "I . . ." He was not really up to this. "So we wind up traveling many times faster than light?"

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"Only in relation to our departture point and a large number of others that happen to be more or less coincidental, one way or another. Of ourselves, we are not going anywhere. The speed of light is finite to any object, but our speed is not."

Bransford's fingers felt the pulse in his temple. "So close to home, like a drowning man a yard from shore." He shook himself. "In half an hour we'll be closing Mauger off. You think you will have everything that you need?"

"For this time, yes. We now can make an attempt to return. We hope a successful attempt. But the plan is a one-shot. If we miss—"

On co-ordinates received, the vessel's course was altered. Nearly a day passed as it swept in a stupendously huge orbit to realign and resume its original path to the bright cluster that by deduction had proved to be, or at least to contain, their original trail guide, Alpha Centauri.

The left side of Mauger was kept comatose.

On target once more and heading out, the craft sped to a precise point locationally defined at Base from references given of the configuration of the strange heavens. From this point it had been calculated that an attempt to return would have the broadest margin for success; delivering them neither too short of, nor too far past, familiar territory. They would be brought to within comfortable range—if the theory held good.

The vessel was turned over to aim at the receding area hopefully thought to contain their initial departure point.

The vessel was trimmed with infinite care. Minutes began to count, and then seconds. At the pre-determined moment adjudged to be exact, the plus-plus drive was thrown into 1-G thrust for thirty-eight minutes twenty-one seconds.

"The gates have been opened," Professor Lippseldych said, "and through the gates we glimpse a limitless horizon. A vast amount of revisional research lies in front of us, but a giant step has been taken and now we know beyond doubt that the rich prize of the Universe can be ours."

"Professor, this fantastic acceleration effect, what you call the 9-10 ratio, do you think this is the upper limit of relative speed, or do you think that even higher parting speeds are attainable?"

"From the evidence we have gained it would seem that, after a certain point has been passed, there is an increase in divisive motion in direct proportion to the percentage of light speed reached. Thus at 90% the factor is 10. At 99% the factor is 100. At 99.9% the factor is a thousand. These consequences, if proved, will give us enormous mobility.

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"As to achieving 100% or over of L.S. we cannot know. This is something else, although here again the circumstances would be relative. In areas beyond our Universe where objects may be leaving us now at L.S. or better, such a vehicle would 'lose' speed the farther it went until it found itself in a sector of motionally stable equilibrium within compatible boundaries of velocity."

"With the knowledge you now have, Professor, can you now say what happened to the first two vehicles that were lost out there?"

"Ah, no." Lippseldych swiveled his chair from side to side as he spoke. "So many things could have happened to them. Cut off, who can guess what decisions they may have made in their efforts to return? The correct assessment being unlikely to be formulated, they would be predisposed to error and though only fractionally penetrated into the forest, it is certain that they plunged even more deeply into the trees in their endeavors to escape."

"Will more flights be made now?"

"Out and back on the known path, yes. Charts and correlations will have to be made, and it will be some years yet before we are actually able to visit the nearer stars with any degree of navigational confidence. We shall have to design communications capsules that exploit the principle we have discovered."

"How much luck do you think was in your 'third time lucky,' Professor?"

"A very, very great deal. The return was made but was by no means a bull's-eye. They were fortunate to arrive only three days out. It was sheer good luck that we hit the target area at all."

Bransford was away, consulting upon the revivification of Mauger's right side. The left side of Mauger was thought to be under sedation.

But under an imperative signal Mauger awoke to stare at the ceiling of his dimly-lit room. It was a famliar room. It was the room he had come to know so well at the beginning of his "training."

What had wakened him? It was very quiet. Was he dreaming? No. No, they were back.

Slowly he assimilated this, checking, becoming more aware, something huge in his mind not wishing to come to the fore.

Quiet. They were back. They *were* back. It was over then, all over. Safely back. That should mean something. What should it mean? A fortune, wasn't it? That was it. Famous. The most famous man in the world. Mauger. All over. End of contract. What was wrong? That was good, wasn't it? That would mean . . . That would mean—

Mauger listened. His heart picked up pace. Loosely strapped, he wriggled his arm free, raised his hand to his head, plugged his ear with his finger.

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He was not thinking properly. What was it? Something . . . He should . . . There should be . . . He could not feel . . . He could not sense . . . He could not, did not, was no longer . . .

He looked down at the straps that held him. Feverishly he began to paw the fastenings undone. He started to whimper.

On hand and knee, terribly weak, using the wall for support, babbling, trailing some of the leads that had been plugged to monitoring equipment, he scrambled, scrabbled to reach the elevator.

A strange nurse turned the corner into the corridor and almost stumbled over him.

She looked down. A half-face wildly distorted against a blind glossy bulb with a sharp-etched "V" to complete the gaping mouth. No shoulder or chest, but clothing tight on an insect bulge of abdomen.

That eye! She reeled back appalled, her mouth opening and closing soundlessly, reaching behind her, finding a wall, flattening, sliding along it, away, watching, fascinatedly watching, fighting an overwhelming urge to faint, scream, yet dreading to faint!

Gasping, Mauger lurched on, clutched the jamb of the elevator, stabbed at the Call button, collapsed.

The nurse closed her eyes.

Sobbing, Mauger with frenetic strength dragged and heaved his body upright, leaned against the elevator doors. He began to keen in a tone so piteously lost and helpless that the nurse was again shocked, opened her eyes now to see an animal bereft and in pain.

Hesitantly, hardly being aware of so doing, she began to move towards him.

"Rom!" Bransford was astounded. "Rom, no!" Weak himself from prolonged periods of weightlessness, he broke into a shambling leaden run down the passageway.

Before either Bransford or the nurse could reach him, the elevator doors slid open and wheeled Mauger crazily on his one leg. His one hand banged, grabbed emptily, and he struck the side of the car, spun and twisted and unavailingly fell into the vacant elevator.

The nurse dropped onto her knees beside him. Bransford thrust, virtually threw her to one side and took her place. "Rom, you fool!" he cried achingly. "What do you think you're doing?"

The half-face was gray now, the eye filmed slightly, some physical sensing of pain seeping through the fog that was beginning to embrace him. He was bewildered. "I'm on the roof. Terrace there. Fish. The rest of me." The eye cleared, focused on Bransford. "I want to be whole. I'm dead. But I want it. It belongs to me. It's mine—"

Bransford put his palm under Mauger's head, gently tried to ease the pressure of the overstrained and

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buckled plasti-bond at Mauger's neck. "Rom, you idiot! What were you trying to do? Oh, God, what a mess! Nurse! Get some bearers immediately! Hurry!"

The left eye glazed. There were blood patches on the cloth that covered the plasti-bond seam. "Famous. Alive famous. Doc, I couldn't feel— It's dead, isn't it? I wanted—"

"Rom, you fool," Bransford said softly, helplessly. "Your right side is frozen, that's all."

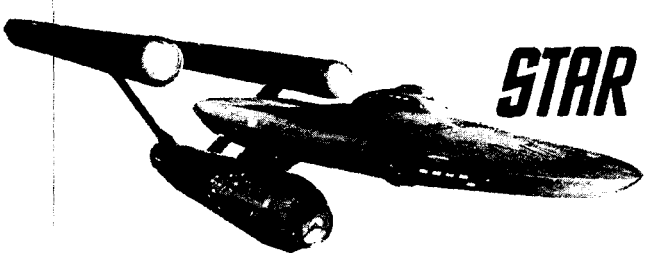
"I . . . didn't . . . know." His breath rattled. "Yes. I forgot. You did. I . . . forgot. My mind . . . funny—"

"Rom." Bransford cradled the awful head in his hands. "Rom, we had it made."

The muscles in the half-face slackened. "Sorry . . . Doc. Seems . . . didn't . . . rap . . . after all . . ."

A trolley came whirling along the corridor brought by the nurse. Two attendants, heads bobbing, hovered to assist.

Bransford stayed on his knees. Slowly he reached out a forefinger and closed the one staring eye. ■



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LAFFERTY

It is highly unlikely that an electrical engineer should undertake a writing career in his fifties. It is equally unlikely that he should be an immediate success, not only in science fiction but in more literary circles. It is completely unlikely that he should be "introduced" to paperback readers in three book-length yarns published at almost the same time by two different publishers. But that's R.A. Lafferty for you . . . and you'll probably either roll on the floor or heave the books in the trash. I'm still rolling.

To take the least and most outrageous of the three first, "Space Chantey" (Ace Books No. H-56; 123 pp.; 60¢—Ernest Hill's "Pity About Earth" on the flip side) puts Space Captain Roadstrum and his crew through a far-future counterpart of the misadventures of that noted Greek seafarer, Odysseus. The parallel is carried through almost bout-by-bout, boisterously, bawdily, hilariously. Captain Roadstrum has a touch of the "half horse, half alligator" strain of the Ohio rivermen in him, and maybe a little of Cuchulain. As a sample of the rare flavor of the book, let's quote from the beginning of the chapter in which the spacerov-

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ers are about to encounter a stand-in for Circe. "Here there are warlocks and mandragoras and witches," reports the ship's log . . . and Roadstrum complains: "When your machines start to go droll on you, you're in trouble." And so he was. Got out of it, too.

"The Reefs of Earth" (Berkley Books No. X-1528; 144 pp.; 60¢) is something totally different. A rural hamlet somewhere in the Midwest is unlucky enough to become a haven for the six Dulanty children —seven, if you count Bad John. Irish they may sound, and they certainly act like all the slanders upon that noble race ever perpetrated in vaudeville and on TV, but they are in fact Pucas from some world immaterial, and they do not really fit in very well on our kind of planet. There is horrible doggerel all through "Space Chantey," and the chapter headings of "Reefs" make a kind of ballad which should suggest the flavor of the book:

"To Slay the Folks and Cleanse the Land / And Leave the World a Reeking Roastie / High Purpose of the Gallant Band / And Six Were Kids and One a Ghostie (sort of)./ A Child's a Monster Still Uncurled / The World's a Trap, and None Can Quit It— / The "Strife Dulanty" With the World/ Was Mostly That They Didn't Fit It./ No Setting for the Gallant Brood/ In Sacred Groves of Yew or Lindens/ They Found a Hold More Near Their Blood/ A Mountainful of Murdered Indians/ In Brazen Clash of Helm and Greave/ Fit Subject for Heroic Chantey/ The Battle Joined That Could But Leave/ Or Altered World or Dead Dulanty." Outrageous! Grand!

Neither book will prepare you for the Lafferty of "Past Master" (Ace No. H-54; 191 pp.; 60¢). Here is Lafferty with what might be an allegory of our own society, developed into the harmonious glory of a golden mediocrity (see page 134, for example). Here is Lafferty writing like the heir of "Cordwainer Smith," yet always completely himself—more macabre, more cryptic, with more of the humor of the incongruous that crystallizes in the Dulanty clan. Here is what Samuel Delany calls "ultraviolet" humor on the cover, and Harlan Ellison "a great galloping madman of a novel," and I agree with them both.

We see this perverted utopia of the far future over the shoulder of the man who invented the word, Sir Thomas More, dragged out of his own time, just before his execution, to serve as a kind of ice-breaking sacrificial lamb for the Establishment of the planet Astrobe, where the gold is getting tarnished by blood and vomit. These men and near-men have names like Kingmaker, Pottscamp, Fabelo, Northprophet, Dobowski, Haddad, Dulldoggle, Stoimenof—and there's the ansel, Rimrock, and the ghost-girl Evita. Joycean? A lit-

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tle. Outlandish? A lot. But it rings and sings true, and it will make you wince from time to time.

Thomas More isn't the "man for all seasons" you saw in the play or the film—but that More is in him. The Puca Dulantys aren't the Irish "pookas" of legend, but they're as impish and dangerous. Roadstrum certainly isn't Odysseus, but they'd drink well together.

The political scientist who preferred to show us the future as "Cordwainer Smith" had a flavor all his own. So has Samuel Delany. So has Roger Zelazny. So has Harlan Ellison. So—if you insist on the classics—had and have Heinlein, Sturgeon, Kornbluth, Kuttner, and John Campbell as Don A. Stuart. They never let their individuality limit them. And neither—I guarantee it—will Lafferty.

THE NEBULA AWARDS

Granfalloon, a fanzine published by a student group at Carnegie Tech—oops! Carnegie-Mellon University—beat the Science-Fiction Writers of America with the announcement of the Nebula awards for best science fiction of 1967. *Science Fiction Times* showed up a little later with a list of the runners-up.

Star of the year is Samuel R. Delany, who took the awards for best novel—"The Einstein Intersection," with its unique combination of mythology, music and what have you—and best short story. The latter was "Aye, and Gomorrah" from Harlan Ellison's anthology of original "New Wave" stories, "Dangerous Visions"—it was Delany's first short story, and a unique and successful treatment of sex. (Just to demonstrate his versatility, Delany's "Driftglass" was a runner-up.)

No mistake: whatever you think of the success of "Dangerous Visions" as a book, stories from it were all over the place as the voting went down to the wire. Fritz Leiber's "Gonna Roll the Bones"—which I consider fantasy, not science fiction at all—was best novelette. Philip José Farmer's "Riders of the Purple Wage" and Theodore Sturgeon's "If All Men Were Brothers, Would You Let One Marry Your Sister?" were contenders for best novella—won by Michael Moorcock's effective and controversial "Behold the Man," a time-traveling attempt to find Christ.

Almost any of the runners up for best novel would have taken the award in another year, and one of them may win a "Hugo" at the Labor Day science-fiction convention in Oakland, California . . . doubtless over as you see this. They were Robert Silverberg's "Thorns" (his multiply anthologized "Hawksbill Station" stood third in the novella ballotting), Hayden Howard's strange "The Eskimo Invasion," Piers Anthony's "Chthon," and Roger Zelazny's unique "Lord of Light."

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Second place in the novella class was taken by Anne McCaffrey's "Weyr Search," here in Analog last fall. When her Weyr stories are combined in a book, she is likely to get a second chance at the awards. Novelette runners-up were Roger Zelazny's "The Keys to December" and "This Mortal Mountain," Harlan Ellison's "Pretty Maggie Moneyeyes"—which I also consider fantasy, and Larry Niven's "Flatlander." Two from Damon Knight's anthologies of original SF, "Baby, You Were Great," by Kate Wilhelm, and "The Doctor," by Theodore Thomas, plus Fritz Leiber's "Answering Service" from *If*, got into the top five short stories, where a sixth story, R. Bretnor's "Earthwoman," tied with "Driftglass."

You'll probably hear about the Hugo winners before I do.

PSYCHOCERAMIC

Whether Plato made up Atlantis out of whole cloth or whether he was passing along a real legend—plausibly, of the destruction of the Minoan empire by the explosion of Thera—is subject to argument. The Thera possibility makes me a believer again. When it comes to Mu, on the other hand, I see no alternative to taking the gospels according to Churchward as purest crackpottery. (The faithful are welcome to cast spells at me; they're mostly occultists anyway and have demons at their beck and call.)

If you have wondered what all the Muing and caterwauling is about, you probably could not find Churchward's thirty-seven-year-old books in the library, or anywhere else except at fancy prices in a rare or occult bookstore. This sad state of affairs is now remedied by Paperback Library: all four books are out in the paperback editions listed below, minus some of the original illustrations. Read and make up your own mind.

THE LOST CONTINENT OF MU
By James Churchward • Paperback Books, New York • No. 54-616 • 286 pp. • 75¢

The nutshell. The other books are amplification.

THE CHILDREN OF MU
By James Churchward • Paperback Books No. 54-639 • 223 pp. • 75¢

How the Earth was peopled from Mu.

THE SACRED SYMBOLS OF MU
By James Churchward • Paperback Books No. 54-663 • 222 pp. • 75¢

Proving that you can prove anything with symbols.

THE COSMIC FORCES OF MU
By James Churchward • Paperback Library No. 54-678 • 191 pp. • 75¢

If you thought Velikovsky was wild-eyed, read Churchward's version of physics and biology.

While you're in the mood, read the paperback of Velikovsky's sec-

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ond book, which presents history as a cataclysm:

EARTH IN UPHEAVAL
By Immanuel Velikovsky • Dell Publishing Co., New York • No. 2203 • 288 pp. • Index • 75¢

And to get the bad taste out of your mouth, read a collection of Willy Ley's science columns from *Galaxy*.

FOR YOUR INFORMATION: ON EARTH AND IN THE SKY
By Willy Ley • Ace Books, New York • No. H-55 • 192 pp. • 60¢

THE WOODROW WILSON DIME
By Jack Finney • Simon and Schuster, New York • 1968 190 pp. • $4.95

You should remember Jack Finney from his occasional stories in the one-time *Saturday Evening Post*, back in the days when it also published Heinlein. Some of them were collected in "The Third Level" and "I Love Galesburg in the Springtime," and some of them were very good. Or, maybe, you'll recall the pretty good film made of his "Invasion of the Bodysnatchers." Here he goes again.

When Ben Bennell, unhappily married, unhappily employed, gets a Woodrow Wilson dime in change he realizes that it may be his passport into the alternate time stream it strayed from. It just may be a time in which things turned out better—in which he made different choices at crisis points. He plays his hunch, and finds himself in that better world . . . only there are some rough spots there, too.

Jack Finney wrote what I'm told was a pretty funny movie, "Good Neighbor Sam"—good enough, anyway, for Jack Lemmon. He has consequently given us some pretty funny SF.

NOVA
By Samuel R. Delany • Doubleday & Co., Garden City, N.Y. • 1968 • 279 pp. • $4.95

I don't think Delany's hardback debut is going to win him any more Hugo's or Nebula's as his paperbacks have—he may even beat himself out for one or both prizes before the year is out—but from anyone else it would be a blockbuster. He has taken the Ahab theme out of "Moby Dick"—the Grail quest entangled in obsession—projected it into space and the future, and brought on stage a collection of highly individualized archetypes to go through the paces of the ritual pavane. He has invented a new kind of instrument that you'd swear is playable, and an odd, gentle, haunted man to play it. He has built his story around a possibility of mathematical cosmology that you'd swear is right out of *Physical Review Letters*—and maybe it is, for Delany is poet, musician and sometime mathematician as well as many other things.

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In Prince Red, the villain of the piece, whose destruction is the goal Lorq von Ray seeks in the bowels of an exploding nova, he has the kind of Renaissance man John Barrymore might have played. In Ruby Red, heiress to the commercial empire of the Draco complex, he has a kind of non-heroine who, being a Red, could never have been anything but what she is. And so it goes—fascinating details of complexly created worlds, new physical and cosmological concepts as believable and outrageous as anything "Doc" Smith ever invented, creatures, people, incidents, flashes of beauty and of ugliness.

In short, it's a Delany book.

From the Movies

2001: A SPACE ODYSSEY

Presented in Cinerama by MGM; directed and produced by Stanley Kubrick; screenplay by Stanley Kubrick and Arthur C. Clarke.

For three years we have waited while Stanley Kubrick and Arthur C. Clarke wrote the screenplay and put on film this 10-million dollar epic. Made for the most part in England, it was, to quote Clarke, "Britain's biggest space program." Carefully-timed advance publicity handouts were tantalizing. As we waited, we thought that here, perhaps, would be a suitable sequel to the fabulous "Destination Moon" made twenty years ago. Here, perhaps, might be a film that would do for this generation what "Destination Moon" did for the generation that is now building Apollo spacecraft. Here, perhaps, might be a film that would rejuvenate the lagging public interest in our space program.

When the final title credits were flashed across the Cinerama screen after the New York premier, I sat there with the feeling that I'd been had.

It's too bad that the film is billed as science fiction, because it isn't. It is ninety percent "gee whiz" science gadgetry and ten percent fantasy nonsense. Basically, the plot —what there is of it—is a mixed-up, un-resolved mish-mash of s-f yarns by Clarke and others, all of which suffer from the screenplay synthesis. The plot isn't one because of something that is rarely lacking in these pages: characterization and conflict.

Insofar as technology goes, Kubrick spared little expense to gain believability and accuracy, even to the point of having commonplace trademarks on much of the equipment . . . for which the companies involved paid well, I am told. A lot of aerospace firms were conned into designing the equipment as well, and I also understand that some of them are a mite upset now. Especially a large computer and business machine company whose trademark is on much equipment in the film. After all, wouldn't you be upset if you made computers and

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if the film showed a computer as a murderer . . . because Kubrick and Clarke did not use or recall Asimov's Three Laws of Robotics?

A lot of people will go to see this film with the idea that it is adventure, as the ads and PR have plugged. They will believe that it is a solid look at the technology of the future. They will instead see a film that is the most cleverly made, subtly done attack on science and technology that has ever been made.

Kubrick's prior film endeavor was "Dr. Strangelove," another violently anti-science film that was bearable because it was absurd comedy. His philosophy comes through in "Space Odyssey" as well, saying that mankind cannot conquer either the universe or himself, is the slave of the technological tools he makes, and will destroy himself. Clarke's transcendental philosophy expressed in "Childhood's End" comes through as well, saying that mankind's ultimate destiny is the concept of pure mind detached from the physical universe, a totally Oriental outlook.

Neither outlook has much faith in or knowledge of mankind.

This plotless romp through the special-effects studio will scare the living hell out of most people because it disintegrates into an unexplainable, nonscientific, anti-intellectual psychedelic nightmare that is guaranteed to produce psychological trauma in any person who does not have his head screwed on tightly. I predict that it will cause some unstable persons to blow their minds. In that respect, it is dangerous. If you go to see it, install slow-blow fuses ahead of time.

Cinematically, the film could use some tight editing in a rather ruthless fashion. It's length of two hours forty minutes could be cut by about an hour. Another five minutes of film carefully written and shot as an ending could resolve the entire epic into a true classic . . . but it isn't there. Kubrick and Clarke started out to make a s-f space film, couldn't figure out where they were going, shot up a lot of expensive footage, couldn't figure out how to end it all, and probably had to finally release it under pressure of the financial backers.

As a film about the past, present and future of the human race, it was sterile. The only women in it were a couple of sexless rocket shuttle stewardesses and three Soviet female scientists, all walk-on parts. This is because Kubrick has said that he thinks machines are the sexiest things around right now. So the final scene shows a human fetus gazing down on the planet Earth from an orbiting placenta . . . which is a properly sick ending for this unsane LSD hippie trip called "2001: A Space Odyssey."

"Star Trek" is doing a better job with a lot less money and fanfare.

G. Harry Stine

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brass tacks

Dear Mr. Campbell:

As usual I was reading Analog (June 1968) from cover to cover and encountered your account of chemical warfare and reduced blood pressure in snakes that are held vertically (Editorial pp. 5-7, 172-178: Note p. 174). Biologically this sounds plausible and incidentally makes excellent sense, ethnologically.

For many years tourists, ethnographers and eminent herpetologists have been concerned with the general inability of rattlesnakes to remain in character during the performances of the Hopi Indian snake dance. With few exceptions they "appear drugged" and do not strike despite extreme provocation.

In their handling of these various reptiles—other snakes are included—the Hopi hold the snakes suspended from near the animal's head, sometimes even stroking them downwards, whereupon the reptiles become "docile." During the public performance of the Snake Dance the animals are held near the head clasped in the human performer's mouth, the body of the snake hanging—or at Oraibi, held—vertically below. In the performances I have witnessed I noted that the snake is allowed to "recover" and begin to move before being picked up and again held suspended from near the head for the rest of the performance. At the conclusion of this ritual the snakes are thrown into a common pile and almost immediately snatched up and carried from the village.

The general, though not universal failure of these snakes to strike the performers during these activities has been a heretofore unexplained and perplexing observation. As you point out, the snake heart is designed to function in a near horizontal position and when the animal is held vertically it is unable to drive enough blood up the length of the elongated body to adequately service the brain. Hence the reptile under these con-

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ditions suffers a partial "black out."

Well I'll be darned.

ALFRED F. WHITING
Curator of Anthropology
Dartmouth College Museum
Hanover, New Hampshire

Hey! I never thought of that application myself!

Gentlemen:

Greatly as I admire the thoughts expressed in your editorial on chemical warfare, and while I am entirely in sympathy with your suggestions of tranquilizers and similar peace-compelling techniques, this constitutes but one aspect of many.

As one who has spent some of his student years in the Department of Forensic Medicine of the University of Vienna where much of the development work in the organic chemistry division of "yellow cross" was made—which is credited to have won the Isonzo Campaign—I was aware that mustard gas and its derivatives plus chlorine and chlorine-phosgene mixtures used at that time were a heavily offensive weapon. The respiratory masks to combat this form of danger came along comparatively slowly and the casualties due to this type of attack were heavy.

We are not speaking of a temporary incapacitating. I speak from personal experience of those men who practically tried to cough their lungs out and either died a most horrible death or were invalided for the rest of their lives. The stalemate temporarily reached that none of the great combative powers use war gases may be ascribed more to the horror of mutual reciprocity and lack of defense than to humanitarian reasons. Legal agreements notwithstanding, it is almost the same stalemate that we have today in nuclear weapons.

Chemical warfare as generally understood today reaches from blister gases such as nitrogen, mustard and lewisite to nerve gases such as Tabun, Soman and many others. It includes blood poisons such as hydrogen cyanide, vomiting gases such as Adamsite, choking gases such as diphosgene, tear gas and a whole arsenal of chemicals that either kill, maim or leave permanent damage.

Several of them, particularly if applied in combination, are without a really effective antidote.

Chemical warfare as understood today in no way limits itself to relaxants and tranquilizers.

Let us also consider that the above mentioned parts of chemical warfare refer this far to chemical agents only that are dispersed as essentially similar to true gases. There are also liquid chemical agents that poison ground, skin and other surfaces with toxic materials. Combine this with the wind action that may blow such poisons back to the attacker and we are dealing with the release of materials that are dangerous to friend and foe.

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The above doesn't even begin to cover the poisoning of wells and water supplies and the ease with which chemical warfare can lead to bacterial warfare and the distribution of radioactive wastes.

This hardly can be classified under "forcing the enemy to the conference." It falls, rather, under the old Biblical injunction that "Those that live by the sword will die by the sword."

Relaxants and tranquilizers constitute, alas, only one very limited aspect of a terrible spectrum of chemical warfare agents. An editorial that ends with "If you're truly in favor of peace—then vote all out for the use of chemical warfare only!" *should stress* again and again that it discusses this one limited aspect only and not the whole general arsenal of poison gases that kill in a horrible manner.

(DR.) ERWIN J. SAXL

Tensitron, Inc.,
Harvard, Massachusetts 01451

I did make the point that the destructive and lethal agents available are less desirable FROM THE ATTACKERS' VIEWPOINT than the "on the floor" agents.

Dear Mr. Campbell:

I enjoyed "Inherited Xenophobia," but as a blood-bank technician may I clear up one technical point?

You stated that Group O, "universal donor" blood does not carry antibodies against A, B, or AB cells. Not so—O blood does have those antibodies, but when one pint of donor blood is mixed with 4-5 quarts of the recipient's blood those antibodies are *usually* diluted to a safe level.

If the donor's antibodies are unusually strong, or the blood is given too fast, or if too much O blood is given to someone of a different type, the donor's antibodies may attack the recipient's cells with disastrous results. That's why universal donors are more popular in fiction than in blood banks.

This problem of immune reactions has some interesting angles. If it's likely that we've all had a few cancer cells, but such cells are normally destroyed as fast as they appear—then the amazing medical progress of the past century might be one reason for the increasing incidence of cancer today! People with inadequate IFF systems no longer die young; modern medicine keeps them alive *to reproduce their kind*. So what happens when their kind encounter an ailment that still resists the miracle drugs?

And if the transplant experts ever learn how to suppress the immune reaction completely—will the result be that their operations are successful, but their patients inevitably die of cancer? A cheerful choice . . .

CLEO HINDMAN

Box 32
Stockport, Ohio

Diptheria used to kill susceptible

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individuals young; now they survive. When two highly susceptibles mate, their children tend to be so susceptible not even powerful antitoxin and antibiotics are enough to save the defenseless metabolism!

Dear Mr. Campbell:

You did your homework quite well this time, but missed a couple of points. There is apparently a learning period for the IFF system, during which it is taught who are friends and who foes: anything present in the body at that time is friend; anything not, foe. Mice given skin grafts from totally unrelated mice at this time accept them, and will accept them when adult, although they would reject them if not exposed early. Some people with type A blood do not react if exposed to type B—a probable reason is that they were exposed to B, or to something with the same antigenicity, during their immunological education.

On the other hand, there are many diseases of reaction against the body's own tissues—auto-immune diseases. My pathology text includes systemic lupus erythematosis, Hashimoto's thyroiditis, some hemolytic anemias, rheumatoid arthritis, glomerulonephritis, idiopathic thrombocytopenic purpura, *et al.*, with varying probabilities. The other major way the system goes wrong, as you point out, is in cancer. Tumors produce tumor-specific antigens, which the immunologic system never saw before the person developed the tumor. So it should reject it. Most of the time it probably does; occasionally it misses, and we see a clinically apparent tumor. However, not all antigens are equally powerfully antigenic: the antigens of the A-B-O blood system, for instance, are more potent than any of the Rh antigens. It may be merely that tumor-specific antigens aren't potent antigens. Another possibility, since tolerance to an antigen can be produced by exposure during that critical "educational" period *or* by prolonged, slight exposure in adulthood—witness desensitization to bee venom—is that tumor cells, through sheer persistence, cause development of tolerance to themselves.

At any rate, there have been cases of successful—to a degree—treatment of tumors by matching two patients with the same tumor, and transplanting a piece of each tumor into the other patient. When he reacts against his foreign tissue, he sometimes also reacts against his own tumor, and rejects it.

Tuberculosis: A large part of the body's reaction is due to *hyper*sensitivity to the tuberculoprotein in the bacterium. In someone who has been exposed, and hence had formed antibodies, injection of purified tuberculoprotein, or of heat-killed bacteria, stimulates "tuberculosis," with formation of a classical Ghon tubercle, which on examination is identical with that of the true

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disease. However, it is also the immune reaction that isolates, hopefully, and localizes the bacteria.

Transfusions: they work, but not because the transfused blood is "temporary." Radioactive tracer studies, among other things, have shown that properly crossmatched blood is destroyed and removed at the same rate as the host's own blood; there is no rejection. The reason is that the tissues—blood—are matched as to antigenic structure, for major antigens—A, B, R—and there is consequently very little antigenicity, if any, for the IFF system to grab. This crossmatching is being done now in solid tissue transplants, hearts included. The art of typing and crossmatching for "histocompatibility factors" is rather new for solid organs, but very promising—as promising as it was for blood. Match donor and host for surface antigens on their kidney cells, or heart cells, or whatever, and there should be little or no rejection. Take care of what rejection there is with immunosuppressives —dangerous, with the risk of infection while on them—and then taper off them when tolerance has taught the IFF system to accept the transplant.

Yes, it would be nice if we didn't have to worry about transplanting, and could simply grow new organs. But . . . I haven't any info about whole organ cultures, but I do about cell culture. Take an animal organ, emulsify it down to small cell clumps, put it on media and try to culture it. By the time you have a single cell line that is successfully reproducing itself, the morphology and behavior of the cells are radically changed; changed to survive better in an environment it was never intended for. Implant some of this culture back in the original donor, and it grows. *How* it grows! It is a cancer. Ooops . . . But that is the state of the art. Given future techniques good enough to grow, or regrow, an entire, healthy, functioning organ *in vitro*, from a bunch of totipotent cells, why not do it *in vivo* to replace or, better yet, repair the defective organ? As for transplanting at present—it ain't the best, but it's the only game in town.

There may be other ways, though. Hans Selye, working on the aging process, has induced mice to replace a traumatically aged, calcified skin with a "new," "young" one, actually shedding the old skin. Now if we could do that with a diseased kidney. . . .

JAMES R. SAKLAD
153 Morris Avenue
Providence, Rhode Island

Blood is a temporary tissue—even your own blood cells have a relatively short life span of months, not decades.

Dear Mr. Campbell:

Several years ago in *Astounding Science Fiction* you printed two articles on psionic machines, one using hardware, the other symbolic

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circuitry. I was told about this by a friend who has been experimenting for several years. He showed me the articles torn from the magazines and I decided to build the symbolic model.

I wish to report my findings. I am twenty-four years old, scientifically inclined, and work as an electronics technician; judging from your survey this doesn't make me an ideal subject. I used your basic circuit with slight modifications in the layout. The device was built in a shoebox with the dial and detector plate mounted on the lid. I used pennies, nickles, dimes and quarters for samples.

My responses were not strong and I had to tune slowly in order not to miss them. I could not actually feel a difference readily; but the lid to the box was flexible and when a response was made it would actually squeak. I found it made no difference if I was looking at the dial —and thus "helping" a response that wasn't there. Repeatability for me was within three dial divisions, or ± 1.5, however you want to look at it. Tuning was broad.

Pennies gave me three responses, two strong, one weak; nickles gave two about the same strength, dimes gave one weak one, and could not be reliably detected. Quarters gave no response, but disabled the machine for periods ranging from two hours to one day. (I have no idea why; it happened on three different days.) All coins had different dial readings. I detected no spurious responses, or responses with no sample in the machine.

I am open minded about this sort of thing, but I must admit I found it very disconcerting to find it actually working for me. Thoughts such as "who am I kidding," and "impossible!" enter, then I try it again. It works again. It must be my imagination! I look at a wall and tune. Dial reads the same. It was a good thing I did this on a week end the first time, because I was literally walking the walls. Wow!

In the article "Unprovable Speculation" you offered help to those interested. I understand that the two you published—and the corrections and addendum—were the only ones in Astounding and Analog. Do you know of any other articles, and if so how could I obtain copies? Why did you not publish more articles? Are there any societies studying the psi phenomenon, other than the crackpot type?

At this point I am interested in duplicating other devices to see what has been done and to educate myself in the state of the art. But it seems to me that with integrated circuitry we should be able to get very sensitive machines. Maybe no one has tried this yet.

I hope the psi articles were not April fool articles, because if they were I am one. I still have trouble believing it.

As long as I am writing, I would like to thank you for Analog. The

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consistent quality of the articles and stories, not to mention the editorials, never fails to amaze me. I missed the science fact articles in the last two issues; I hope you haven't dropped them completely. And I would like to see a few more advertisements (that is a switch) for this usually helps insure the future of a magazine.

JAMES M. HANSEN, CT2

Those were the only articles I know of on psi machines of that class, in any but the regular journals of what they call "radionics"—what you've somewhat unfairly designated "the crackpot type," without looking into them.

I remain strongly interested in seeing psi phenomena investigated. It was after my encounter with the Hieronymous, de la Ware, and Drown machines that I was introduced to the dowsing rod. I've concentrated on the rods since, because they're the ideal introductory experiment for people convinced it's all nonsense. They can be made from wire coathangers, at no cost whatever. They take no special equipment or training whatever. They can be tried out in any backyard or on any street. And they work for some eighty-five percent of all people who try it.

I got somewhat irked by people insisting on discussing the "impossible idea" of the Hieronymous machine, who wouldn't consider trying it. They had an excuse for not making the experimental test; building the thing is expensive and complex. The rods are so simple and cheap that I could demand that critics make the test—"Put up or shut up! You say that the thing is unscientific but say the scientific method is the experimental method. O.K.—make an experiment, or shut up about 'science'!"

Since that eighty-five percent includes people who are vigorously certain the whole thing is utter nonsense, when cornered into making an experiment, nearly all of them get a powerful emotional shock. It works for them.

When trying to communicate a new and disquieting idea, it's much wiser to concentrate on one, simple, readily demonstrated item at a time.

So I haven't published on the Hieronymous machine and the numerous others I know about. Dowsing rods are sufficient of a mind-opener for now!

And that approach seems to be paying off. The Marines are now using the rods with success—and driving the scientists more than slightly frantic!

In about twenty years, the young scientists of the '50s will be the research directors of the '70s. Having grown up with the dowsing rod business in the background, they'll be the ones to do the major developmental research.

Just as the science-fictioneers of the '30s were the developers of atomic power plants and rocket ships in the '50s.

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EDITORIAL

continued from page 7

Sure, the big-time capitalists of the 1890s needed to be forced to compete; what the European Communists have never understood about America is that we do NOT have "monopoly capitalism" over here—we don't have cartels. We have *competitive* capitalism, enforced by the antitrust laws. Makes an enormous difference.

How about having monopoly labor in a culture? Is that better for the general public than monopoly capitalism? Steel labor forced the steel companies to give them a 1.5 billion dollar wage hike. Just who do you think is going to pay for that? Steel stockholders? Don't be silly! The only possible source of that money is the general public—*you're* going to pay it, not some vague other guy. The steel companies promptly, and properly, hiked their prices to make up the difference—and most of the hike was put on tin-plate products. This means the tin cans you get your beer, beans, and beef in, and if you think you don't pay for those tin cans—you're nuts, or something?

When all available political parties act like Tweedledum and Tweedledee, you're being given the free choice of being burglarized at home, or robbed on the highway—two parties but a single "choice." Entropy is approaching maximum as difference approaches zero.

Look up a little political history, and see the *real* difference between Democrats and Republicans fifty or more years ago; then a man went to the polls and was offered a real, important difference to choose between.

As of now (August 2, 1968) I don't know who's going to be nominated as the Republican and Democratic candidates for president—and it doesn't make any difference, really, because the four major candidates all stand for the same things. The unimportance of the difference is shown by the fact that the platform is written before the man is nominated—and the two party platforms are, predictably, going to offer essentially the same philosophy. Do you think one of them might come out with a plank suggesting that Big Labor needs to be curbed—its powerful monopolies broken up? Or that one might have a plank proposing constitutional amendments that will restore the power of the police to act effectively against crime and criminals by a constitutional process that the Supreme Court *can't* overturn?

Or a plank calling for a real, unbiased scientific study of the actual genetic differences between races, so that educational systems can be redesigned to provide the most effective types of training, by the most effective approaches, for each

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racial group? The last time a Nobel prize winner suggested giving a talk proposing an honest, objective study of the realities of race—simply proposing a study be made!—the scheduled symposium he had been invited to participate in was hastily canceled. Our political entropy has reached such a stage that not even a Nobel prize winner can be permitted to *suggest* that *possibly* there might be something to study!

On the Vietnam War issue, you can expect interchangeable platform planks; they'll both be in favor of the quickest possible honorable peace settlement, and a political (i.e. negotiated) truce.

Try using a little imagination, and what sort of platform would Teddy Roosevelt have proposed? You can guarantee that you'd have been offered something besides the me-too Tweedledum-Tweedledee choice we'll be offered this year by the two major parties that think as one.

I mentioned back there a way that the two things all politicians can come out four-square in favor of were Motherhood and Freedom. The automatic holiness of Motherhood was discussed—but I skipped the matter of Freedom.

You, my friends, will be allowed the precious Freedom to vote—for either of two essentially identical candidates. That's Freedom? How about being more honest, as they are in Communist countries, and simply offer just the one candidate of the one permitted party? There's not much less freedom, but considerably more honesty in that system, it seems to me. Please note carefully that both East Germany and Czechoslovakia have the same one-party Communist government . . . but they don't seem to represent a maximum-entropy identity of thought. The great philosophical difference between those one-party systems certainly exceeds vastly the philosophical differences between our two-party Democrat and Republican system.

Those of you who have read my editorials for any length of time are, I'm fairly sure, aware of my dedication to attacking any one-sided propositions, in any field of human thought, be it medicine, physics, philosophy and/or politics. If official medicine attacks a man as a medical quack—that proves not that the man is a cheat and a fraud but solely that the M.D.'s don't accept his approach. It does *not* per se prove him wrong. Astrophysicists may unanimously agree (they don't actually!) that astrology is one hundred percent silly nonsense; that proves one, and only one thing—that they don't like astrology, not that it is in fact valueless.

This election year I am faced with a one-philosophy political system, displaying near-maximum entropy.

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The consequence of the nature of that high-entropy system, and my own nature, is that I'm voting for George Wallace this time.

I don't particularly like a lot of Wallace's ideas—but I think it most important that I have a chance to say, effectively, to both of those one-philosophy major parties, "Dammit, I want a chance to vote for a different approach!"

Merely refraining from voting for either party has no result. Remember, one way to win an election, if you're actually in the minority, is to get all your friends to go to the polls, while all your enemies are induced to be lazy, indifferent, or sound asleep. That way a ten percent minority can cast ninety percent of the votes and win by a landslide.

To simply refrain from voting hands the election to the one-philosophy system. Wherefore I'm happily taking advantage of the fact that, for once in many, many years, I can vote *against* the two-parties-with-a-single-mind.

I'm simply voting *for* the idea of a two-philosophy political system —the kind the United States used to have. I don't expect George Wallace to win—yet my vote will not be wasted. I do believe that Wallace's attack on the one-philosophy government we now have will be powerful enough to shake the smug self-satisfaction of the one-philosophy parties and give us something besides the "free" choice of whether we want to be hung or shot, or whether we choose fried or scrambled eggs for breakfast. To hell with two chickens in every pot; chickens give me a gout attack.

I want a decrease in the entropy of this country! I want real problems really debated, and the citizens offered a *real* choice in their political elections.

I'm voting for Wallace not because I dearly love his ideas, but because I very deeply resent the one-philosophy, no-choice system offered by the Republicrats.

The Editor

FUNDAMENTAL FACTS

"You cannot strengthen the weak by weakening the strong. You cannot help small men by tearing down big men. You cannot help the poor by destroying the rich. You cannot help the wage earner by pulling down the wage payer. You cannot keep out of trouble by spending more than your income. You cannot further the brotherhood of man by inciting class hatreds. You cannot establish security on borrowed money. You cannot build character and courage by taking away a man's initiative and independence. You cannot help men permanently by doing for them what they could and should do for themselves."

ABRAHAM LINCOLN

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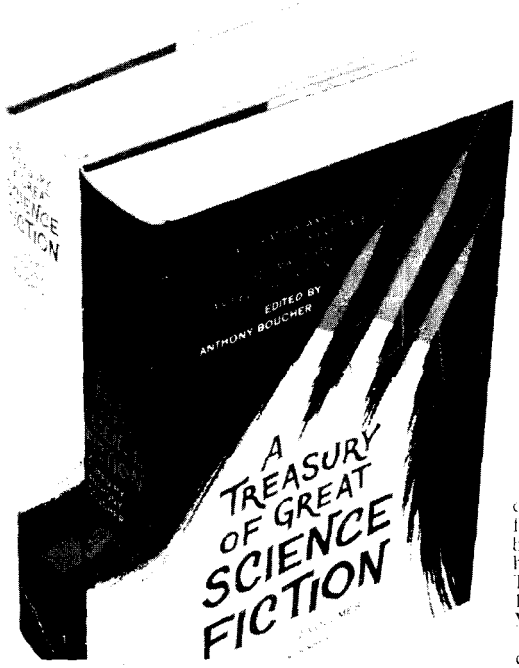

Edited by Anthony Boucher

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